SEP 8 1928

PHYSICAL THERAPY NUMBER—DR. J. C. ELSOM, COLLABORATING

CLINICAL MEDICINE and SURGERY

Medical Lib.

September 1928 Vol. 35, No. 9

LEADING ARTICLES

Physical Therapy in Europe
By Samuel J. Rose, M.D., Lexington, Kentucky

Physical Therapy, Positive and Negative
By J. C. Elsom, M.D., Madison, Wis.

Arthritis Treated by Physical Therapy
A Clinical Report on 100 Cases
By Edwin N. Kime, M.D., Indianapolis, Ind.

How to Develop a Physical Therapy Practice
By Haldor Carlsen, M.D., Chicago

The Diagnosis and Treatment of Sacro-Iliac Strain
By Frank H. Walke, M.D., Shreveport, La.

Physical Therapy Errors
By William A. Lurie, M.D., New Orleans, La.

Acute and Chronic Circulatory Stasis
Treatment by Physical Measures
By William Martin, M.D., Atlantic City, N. J.

Success With Diathermy
By F. W. Schroeder, M.D., Strasburg, Ill.

Physical Therapy and the Traumatic Spine
By J. U. Giesy, M.D., Salt Lake City, Utah

Some Effects of Music on the Human Organism
By Edward Podolsky, Brooklyn, N. Y.

Editorials

Dr. August Bier
A Municipal Light Clinic
Ultraviolet Rays
The Tripod of Healing

In conditions of hypertension—

Theocalcin

Theobromine-calcium salicylate

Well tolerated vasodilator, antispasmodic and diuretic

See New and Non-official Remedies, A. M. A.

In 7½ grain tablets and powder. Dose: 3 to 6 tablets a day

Literature and samples from E. BILHUBER, Inc., 23 West Broadway, New York City

A contrast medium for myelography, pyelography and bronchography

IODIPIN 40%

IODIZED VEGETABLE OILS MERCK

In 2 Cc. ampuls and bottles of 25 Gm.

MERCK & CO. Inc. Rahway, N. J.

Tasty! Effective!

Effective . . . and decidedly pleasing to the taste is this new member of the "Accepted" family . . . *Compound Syrup of Calcreose.*

Write us today for physician's liberal sample to taste and test!

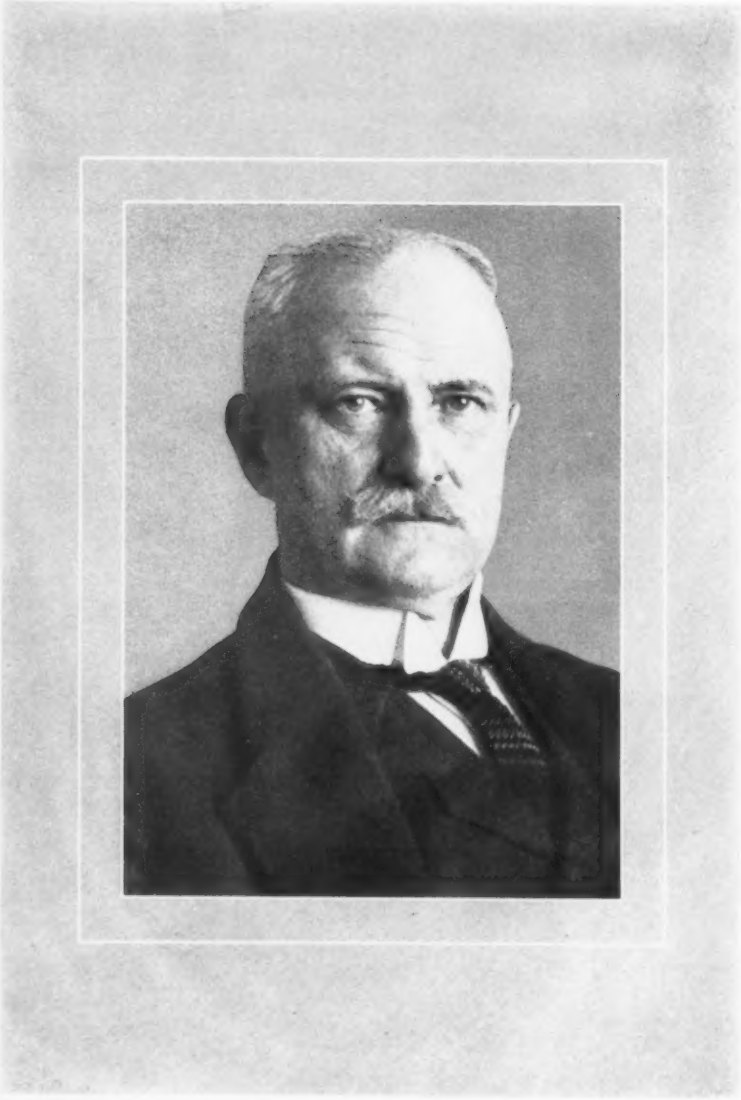
Each fluid ounce of *Compound Syrup of Calcreose Maltbie* represents Calcreose Solution, 160 minims (equivalent to 10 minims of pure creosote); Alcohol, 24 minims; Chloroform, approximately 3 minims; Wild Cherry Bark, 20 grains; Peppermint, Aromatics and Syrup q. s.

Rich in Calcreose . . . which provides the stimulant expectorant action of creosote and avoids gastric distress . . . this new Calcreose product furnishes a remedy for coughs and minor respiratory affections easy to take and quickly effective.

The MALTBIE CHEMICAL CO.
NEWARK, NEW JERSEY

Compound Syrup of

Calcreose



DR. AUGUST BIER

UNIV. OF MICH.

CLINICAL MEDICINE AND SURGERY

VOLUME 35 SEPTEMBER, 1928 NUMBER 9

Dr. August Bier

ONE of the earliest physical therapeutic measures to become popular and achieve some scientific standing in the profession was known as Bier's hyperemia. Heat had been used in domestic medicine for centuries, but it was a thoughtful and fearless German surgeon who rationalized and popularized its use by physicians.

August Bier was born in Helsen, Waldeck, Germany, on November 24, 1861.

His education was sufficiently varied, for he studied at the universities of Berlin, Leipzig and Kiel; and sufficiently thorough, for, a few years after his graduation he became a lecturer (in 1889), at the last-named seat of learning, and was advanced to the rank of a professor in 1894.

In the latter year he was appointed professor and director of the surgical clinic at Greifswald, where he did such notable work that he was called to perform the same type of duties at the universities of Bonn (in 1903) and of Berlin (in 1907), where many of his interesting studies have been carried out.

In Europe, Dr. Bier is widely known as a bold and highly original surgeon, whose researches and daring experiments have added much to the knowledge and technic of modern surgery.

In America he is most widely thought of as the originator of some novel ideas regarding hyperemia, and the inventor of instruments and apparatus for putting these ideas into practice.

His first book on the subject, *Hyperämie als Heilmittel*, appeared in 1903 and was translated into English, by Dr. G. M. Blech, in 1909; but even before the English version appeared, "baking machines" and suction apparatus had come into rather wide vogue in this country.

Bier's idea was that nature's process of healing involves a considerable increase in the amount of blood present in the affected part, and that, if this hyperemia could be brought about deliberately and by artificial means, phagocytosis would be increased, tissue repair hastened and the local resistance of the parts heightened.

This increase in blood supply was obtained, actively, by directing a current of hot air upon the part to be treated, or by placing it, well wrapped so as to avoid burning the skin, in a hot-air box or oven, the temperature of which was then raised to 150° to 300°F. and maintained at that point for varying periods of time, according to the part and the condition being treated. These "bakers" were very popular 20 to 25 years ago, for the treatment

of "rheumatism" and other affections of the joints.

Passive hyperemia was produced by the use of suction (dry cupping), or by the application of an elastic bandage above the diseased part, sufficiently tight to obstruct the venous return flow and allow the blood to accumulate, distal to the bandage.

It is obvious that this latter method could be used only upon the limbs, but much ingenuity was displayed in devising cupping instruments to be applied, not only to the skin surface of the body (as was done by our ancestors), but also to the tonsils and pharynx, the eyes, the nose and even to the genital organs.

Bier's hyperemic treatment requires, however, a high degree of judgment and discretion and no small amount of skill for its successful application, and when it began to be used by all and sundry, as a panacea for most of the ills of the flesh, many disappointments naturally resulted, and the procedures lost professional standing and have largely fallen into disuse in this country, especially since the introduction of diathermy, infrared generators and radiant heat-light lamps. They still have, nonetheless, distinct value, in certain cases.

Dr. Bier is no decrepit valetudinarian at 67. He is still actively at work, as director of the Berlin Surgical Clinic, and may startle the medical world again before he leaves us. As a matter of fact he has recently given his confreres food for thought by demonstrating that the actual cautery is an efficient treatment for infected wounds.

Physical therapy, in its modern sense, is so new that we are sometimes surprised to realize that its pioneers and leaders are still with us and capable of teaching us many new ideas.

Men carry their superiority inside; animals outside.—Russian Proverb.

A Municipal Light Clinic

IN THIS country, at the present time, the greater number of cases of rickets, malnutrition and bone and gland tuberculosis occur in the children of poor and ignorant parents, who have little or no knowledge of hygiene and insufficient financial resources to supply, at all times, a well-balanced diet for their numerous progeny; to say nothing of affording them the advantages of actinotherapy.

At Hull, England, an interesting project was launched in 1924, in the form of a Municipal Light Clinic, for the benefit of children needing such treatment, but whose parents were unable to provide it for them.

Most of the patients for this Clinic are referred from the infant clinics of the city, as requiring light treatment. These are handled in the order of their urgency, after approval, as being suitable, by the Chief of the Clinic.

Each patient is carefully examined on first admission to the Light Clinic, and records are made. Subsequent examinations and records tell an interesting story. Nearly all of those treated show marked improvement. More than 300 patients have been treated in the four years of the Clinic's history.

Tungsten arc and mercury vapor lamps, are used. Treatments are given twice a week, beginning with 1 or 2 minutes, at 30 inches, for the mercury vapor, or 25 inches for the tungsten arc lamp, increasing the time and decreasing the distance gradually. Six weeks constitute a "course" of treatment. Each case is judged and handled on its own merits.

We are far from advocating State Medicine, but if such a clinic can be so handled as not to pauperize those who can afford to pay for actinotherapy, it would seem that it would be useful and valuable in all our larger cities.. If poor women who are pregnant or lactating could receive treatments like these, it ought to cause a material decrease in infant morbidity and mortality, and increase the comfort and well-being of the mothers.

Physical therapy is no longer a heterogeneous mass of untried procedures, in the hands of a group of charlatans, but is a

recognized means for the prophylaxis and treatment of a considerable number of more or less obscure disorders, as well as some which are admirably clear-cut. As such it should enter into the plans of all who are concerned in the general health and well-being of the community at large.

Every man is a politician whether he will or no, for government does not rest upon the opinions of men but upon their actions.—Coolidge.

Ultraviolet Rays

NOW that the ultraviolet rays have become a recognized therapeutic resource in a number of disease conditions, there seems no good reason why they should not be discussed in these editorial pages in the same way that we have been in the habit of discussing drugs.

Ultraviolet rays are a part of the invisible energy spectrum, above or beyond the violet end of the visible or light spectrum, having a wave length of from 4,000 to 2,000 Angstrom units (400 to 200 millimicrons). They are sometimes called the actinic or chemical rays.

These rays are present in direct, summer sunshine, at midday, to the extent of 1 to 3 percent, but their relative quantity is much reduced during the autumn, winter and early spring months, in the morning and afternoon, and also by clouds, fog, smoke and anything which interferes with the transmission of the solar energy. The therapeutically active rays will not pass through ordinary glass, but will penetrate fused quartz, certain especially made kinds of glass and various organic glass substitutes. Their passage is seriously impeded by even the lightest types of clothing and, to a less degree, by wire screening.

Dr. Francis H. Humphris declares that a preference for natural sunlight, as a therapeutic measure, is comparable to a preference for a "mouthful" of a decoction of poppy seeds, rather than a small and accurate dose of morphine. He admits, however, that the accessory factors at certain heliotherapy institutes, like that of Rollier, at Leysin—high altitude, exposure of the body to the air, freedom from dust and smoke, etc.—are valuable adjuncts to treatment.

The *artificial sources* of ultraviolet rays now in use are: (1) The open carbon arc (whose output closely approximates the sun's energy spectrum); (2) the air-cooled mercury arc, inclosed in quartz; and (3) the water-cooled quartz-mercury, or Kromayer lamp. With any of these, under modern conditions, accurate and intensive doses of these rays can be given. The quartz-mercury lamps give off approximately 15 to 30 percent of useful rays, when new; while the open arcs produce from 5 to 25 percent of these rays, depending upon the use of plain or impregnated carbons. The water-cooled lamps produce the highest proportion of the very short, germicidal rays.

Physiologic Effects.—In this discussion we shall confine ourselves to the socalled *vital rays*—those between 2900 and 3200 Angstrom units. These rays act *directly* as a *counterirritant*, producing the typical erythema seen in sunburn; and *indirectly* by a chemical action upon the sterols in the skin, especially *ergosterol*, and probably, also, in some other way or ways not yet understood. It is the indirect effects which are of greatest importance.

The vital ultraviolet rays, in therapeutic doses: (1) Fix calcium, phosphorus, iron and iodine in the body; (2) break down bacterial toxins; (3) increase the hemoglobin and the red and white cells in the blood; (4) normalize metabolism and glandular activity; (5) accelerate the blood and lymph flow and increase elimination; (6) sedate the central and stimulate the sympathetic nervous system; (7) ease certain types of pain; and (8) increase resistance to infection (by virtue of some of the other effects mentioned). The shorter rays, when applied through a quartz applicator, with pressure, are strongly germicidal.

Toxic Effects.—Overdoses of ultraviolet rays cause a severe *erythema* or sunburn.

even to the extent of blistering over the exposed areas, with the constitutional symptoms which would accompany such a condition produced by any other cause, such as lassitude, vertigo, or even vomiting. They also *reduce* the cellular elements in the blood and the resistance to disease and probably cause chemical changes deleterious to the organism. For this reason, the use of this therapeutic agency should not be intrusted to patients or to untrained assistants, except under strictly controlled and prescribed conditions.

The *antidote* to overdoses of ultraviolet rays (as to other burns) is the application of radiant heat-light, generated by a 1,000- to 2,000-Watt, tungsten bulb in a proper apparatus. In the absence of this agency, alkalis, such as bicarbonate of soda solution, or antiseptic-analgesic ointments, such as that of Butesin Picrate, may be applied.

When an overdose has been given, no further irradiations should be applied until all unpleasant effects have disappeared; and then the dose should be very small and should be increased with great caution.

Therapeutic Uses.—The best-defined indication for ultraviolet rays is in the prevention and cure of **rickets** and *tetany*, and in the minor degrees of *calcium and phosphorus deficiency*. They compensate, to a certain extent, for the loss or inefficiency of the parathyroid glands, for a diet deficient in *vitamines*, and for insufficient exposure to the sun's rays.

Pregnant and lactating women should be regularly treated with ultraviolet rays (at the same time giving them calcium lactate, preferably combined with lactose and administered when the stomach is empty), in order to compensate for the loss of calcium which takes place during these periods and thus protect the maternal structures. Infants should also receive regular courses of ultraviolet irradiations for a month or six weeks, at least, during the winter, for the first two or three years.

These rays are also of distinct value in cases of **"neurasthenia"** having no discoverable organic basis; in general malnutrition, *lack of vitality* and mild, unexplained *anemia*; in **acidosis** with calcium deficiency; in **asthma** and **hyperesthetic rhinitis** (applied locally, with a quartz applicator, and generally, with a quartz-mercury or open arc lamp); in **chronic bronchitis** and sensitiveness to acute respiratory disorders; in the treatment and prevention of **x-ray burns**; in certain types of *obesity*; in *carefully selected* cases of **tuberculosis**, particularly when it involves the bones, glands or peritoneum; in a considerable variety of *skin diseases*; and probably in a number of other conditions, especially those dependent upon *lowered systemic resistance*, which have not yet been fully worked out.

Administration and Dosage.—The physician should consider the various types of apparatus for producing ultraviolet rays and select the one best suited to his needs and facilities; after which he should study his apparatus thoroughly, from the mechanical and therapeutic standpoints, so as to be able to develop its possibilities to the greatest extent.

As much of the effect is produced upon the blood, it is well to increase the amount of that fluid in the skin by the antecedent or simultaneous application of radiant heat-light or infrared rays. For this reason, the open carbon arc lamps have certain advantages, as they combine the various types of rays. When a germicidal effect is desired, the blood should be squeezed out of the part by pressure with the applicator.

Dosage depends upon five main factors:

1.—The individual sensitiveness of the patient.

2.—The intensity and composition of the radiation.

3.—The distance between the skin and the arc.

4.—The duration of the exposure.

5.—The temperature.

Patients vary greatly in their susceptibility to the action of ultraviolet rays, and this must be determined in each case, by

experiments on small, localized areas, before prescribing the treatments. As a rule, an initial treatment of 1 to 3 minutes, at a distance of 30 inches (75 cm.), should be used as a standard. The dose may be increased by increasing the time or decreasing the distance, or both. In children, it is better to increase the time, keeping the distance constant.

As a general rule, larger doses will be required by those who have dark complexions or tan easily, and where congested skin areas are being treated. When pigmentation or tanning results from the treatments, the doses must be increased.

Smaller doses will be required by fair people and those with blonde or reddish hair, by those who blister easily, and where normal skin is being treated.

Exposed parts of the body will tolerate larger doses than will those which are habitually covered; women generally require 25 percent smaller doses than do men; children, ½ the adult male dose; and infants, ½ the dose for a child; mucous membranes require more than the skin dose.

If a quartz-mercury lamp is employed, allowance must be made for the number of hours it has been operated, as the intensity of its radiations diminishes with use. The dosage must be regulated by the effects produced.

The frequency of treatment depends upon the degree of erythema resulting. If this is only a transitory blush, treatments may be repeated daily; if mild, alternate days may be used; when there is a severe "sunburn", four or five days should elapse between treatments, which should not be repeated until the skin returns to normal.

It should be remembered that a considerable number of persons show a *developing* erythema, which is more severe after 48 or 72 hours than it was at the end of 24 hours. This is especially true where the quartz-mercury lamp is used.

If physicians will understand that ultraviolet rays are a remedy potent for good or harm; will study their characteristics, indications, limitations and dangers; and then will apply or prescribe them, with the same attention to details of individual susceptibility, physiologic action, dosage and frequency of application, and with the same meticulous judgment which they employ in the use of drugs, the results obtained will be equally predicable and satisfactory.

There is hardly anything in the world that some man cannot make a little worse and sell a little cheaper, and the people who consider price only are the man's lawful prey.—John Ruskin.

The Tripoid of Healing

THE alterations of the structure or functions of the human body, which we call disease, can, as a rule, if they have not advanced too far and too fast, be restored to normal by purely natural forces, unaided by medical art and science. These spontaneous recoveries, however, require so much time and such heavy expenditures of the patient's energy that dependence upon them seems as foolish as walking from New York to Chicago (a perfectly possible feat), when trains—and now airplanes—are running every day.

Sometimes an organ or tissue becomes so seriously or extensively altered that its restoration is impossible; and it may even endanger other structures. In such conditions, *surgery* exercises its proper function by mechanically correcting or removing the damaged or dangerous part.

So long as anatomic or functional restitution is possible, it may be accomplished by means of *drugs* or by *physical measures*—sometimes one; sometimes the other; often both together.

The body's various activities are under the control of the central and autonomic nervous systems, frequently through the medium of the ductless glands. Some drugs act upon the various divisions of the nervous system, producing increase or diminution of certain glandular secretions; stimulation or sedation of certain functions; contraction or dilatation of certain blood vessels; and many other changes.

Physical measures will, in many instances, accomplish the same purposes, if applied with equal intelligence and judgment. Drugs will do certain things which physical agencies will not do; and the converse is also true. Sometimes the successful application of one or both of these methods depends upon preliminary surgical intervention.

Before a man is legally permitted to apply drugs or surgery in the treatment of disease he must secure the degree of Doctor of Medicine and convince the officials of some state of his ability to carry on such practice with safety to the community. During his time of preparation he must study anatomy, physiology, pathology, bacteriology, materia medica and therapeutics and a score or more of other fundamental scientific subjects.

Before the embryo surgeon goes into the operating room, he must have a sound knowledge of the structures he is about to cut and handle, and of the way they behave, in health and disease; otherwise his ignorance might result in incalculable damage to his patient. He must also know what instruments are available for the work in hand, how they are constructed and what they will do.

Before the budding internist or practitioner is permitted to write a prescription for drugs, he must be reasonably familiar with their pharmacologic effects — the changes in body functions produced by their administration; how they act when given in overdoses and the most prompt and effective means for combatting undesired effects; and the best way and time to give them so as to produce the maximum of therapeutic effect in the minimum of time.

Physical agencies are powerful remedies in the treatment of disease, and many of them are applied by complicated and potent apparatus. Some of them may produce unpleasant or even dangerous results, if used unintelligently. Is it asking too much to require that the physical therapist shall know as much about anatomy and, especially, physiology, as the surgeon or internist knows; and sufficient of electricity and other branches of physics to understand the workings of the machinery to whose influence his patients are being subjected?

Why would not a course of lectures and a textbook or two on the pharmacology, toxicology and therapeutics of physical agencies be enormously helpful to those who purpose to use them or are using them? How many physical therapists are as familiar with the indications and limitations for light, heat, baths of various kinds, massage, vibration, etc., as a physician is (or should be) with those for calomel, digitalis, strychnine, insulin, quinine and many other drugs?

If non-medical healers and incompletely educated technicians are permitted to administer physical remedies (except, of course, under the direction and instruction of a *qualified* physician — which does not, just now, mean *all* physicians), the results are almost certain to be as unsatisfactory as would those of the promiscuous and irresponsible giving of drugs by persons who knew little or nothing of their nature and effects.

Only when physical therapy is placed upon the same sort of basis as that upon which surgery and drug therapy are founded, and prescribed or administered by men who thoroughly know the human body and the agencies and apparatus they are using, will these newest factors in the amelioration and cure of disease be in a position where they can be honestly placed where they of right belong—by the side of medicine and surgery, as the third leg of the tripod of healing.

LEADING ARTICLES

Physical Therapy in Europe

By Samuel J. Rose, M.D., *Lexington, Kentucky*

HAVING just completed a clinical tour of many of the important centers of medical activity of England and the Continent, it has occurred to me that possibly some of our American physicians may care to know something first hand of the work of their European colleagues.

The tour was sponsored by the American College of Physical Therapy — and allow me to state parenthetically, that I consider physical therapy, as we in the States view it, to be nothing more than the general practitioner of old, who, we feared, had practically disappeared, returning, better prepared with more and newer weapons with which to attack his ever present enemy, disease.

The noticeably apparent fact that condemnation without investigation is *not* a part of the European physician, seems to be an outstanding first and last impression made on the visiting physician. Each of them seems to have that "nothing is impossible" attitude towards anything and everything. However, it should be distinctly understood that, simply because he does not condemn a given theory or claim made by some known or unknown physician, neither does it mean that he is going to adopt it without first having proven its claim personally. This he goes about quietly and in all probability engages the assistance of one or more able colleagues to carry on a similar investigation, each working independently of the other.

Dr. Niels Finsen.

Dr. Cumberbatch, London

Dr. Cumberbatch's work in St. Bartholomew's Hospital, London, (this hospital is 810 years old), with his combination treatments of internal medicine, surgery, (where indicated) and his chemical, thermal and mechanical treatments is worth serious investigation by any physician, no matter in what branch of medicine he may be interested.

One example of the Doctor's work is well worth mentioning here: In many cases of rheumatoid arthritis, particularly in women, where no focal infection can be elicited, he finds a very large percentage having endocervicitis. This condition he clears up with great celerity and efficiency by means of diathermy.

He uses a block-tin belt around the abdomen as the indifferent electrode and the active electrode inserted in the urethra for ten minutes merely as a test; tolerance is usually found to be about 116°F. The electrode is then removed from the urethra and inserted into the cervix uteri for ten

Finsen Institute. Giving two-hour treatments, by Quartz-rod Compression, with Finsen carbon arc lamps

minutes. No other treatment except a douche of 1-percent lactic acid is used.

Where there is no endocervicitis, he uses general pelvic diathermy, by means of the belt of block-tin about the hips and the active electrode (an insulated vaginal one) inserted well up in the vagina. The temperature used here is about 114°F., for twenty minutes. His results are more than satisfactory, using as an indication the many cases seen, examined and interviewed. The end in view is to normalize endocrine disturbance, which is usually an ovarian dysfunction.

DR. R. H. JOCELYN SWAN, LONDON

Another whose work should be of interest to all surgeons, radiologists, dermatologists and physical therapeutists is R. H. Jocelyn Swan, surgeon-in-chief at the London Cancer Hospital, in which were 810 malignant cases.

The following is a good illustration of one of his tongue cases: His first step is to imbed radium needles, each containing 1 mgm. of radium, not in the mass, but around it. From eight to twelve are inserted and, where possible, are sutured in place with linen. These are allowed to remain from three to five days, depending on the number of needles inserted, and the size of the growth. The case is then one for observation, for possibly six weeks. If there is any suspicion of metastasis, the cervical glands are dissected carefully and then follows x-ray radiation.

He treats cervical cancers by radium alone; and he also found, by microscopic examination of supposedly known benign prostates which he had removed some years previously, that between 14 and 17 percent of cases contained malignant tissue. His findings correspond almost exactly to those of his colleagues. The interesting point regarding Dr. Swan's work is that he is not only a surgeon, but combines and uses personally other agencies that his American cousins, with but few exceptions, do not use. He also suggests that possibly many more prostatitis cases than we at present believe to be so are malignant. Dr. Swan has been at London Cancer Hospital for twenty-five years.

LORD MAYOR TRELOAR HOSPITAL, ALTON, ENGLAND AND FINSEN INSTITUTE COPENHAGEN, DENMARK

In discussing the work of Sir Henry Gauvain, at The Lord Mayor Treloar Hospital, at Alton, England, it is well to compare it with that of Dr. Carl Sonne, at the Finsen Institute, in Copenhagen, since the methods are practically the same.

The Lord Mayor Treloar Hospital is better designed for the treating of cases of surgical tuberculosis, especially of the skin, than is the Finsen Institute, lupus cases predominating in both hospitals. Both use Finsen carbon arc lamps, by compression of the area to be treated. The time of exposure is the same—two hours at a single sitting. Both use general radiation with Finsen lamps, and the London hospital is able to add fresh air and light, due to the fact that the establishment is purposely constructed so that this can be done.

The Treloar Hospital treats only children; while both children and adults are treated at the Finsen Institute. The officials of the latter institution are greatly handicapped, in that their patients, once discharged and returned to their homes, cannot or do not carry out instructions given them regarding hygienic measures.

DR. THIBONNEAU, HÔPITAL SALPÊTRIÈRE, PARIS

One of the outstanding features, in my judgment, in the manner of technic which

Dr. Carl Sonne (right) and Dr. Rekling, of the Finsen Institute.

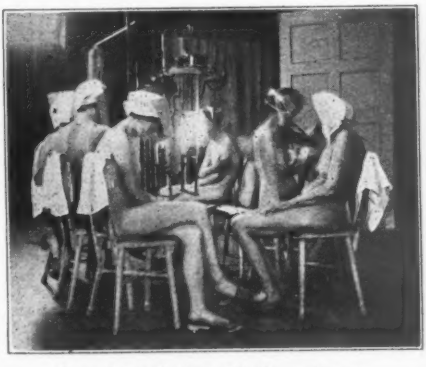
Finsen Institute. Treating Lupus by Compression, with Finsen Lamps.

produces real results, is that of Doctor Thibonneau, of the *Hôpital Salpêtrière*, in Paris. This method he calls iodine and calcium ionization by means of galvanism. The principal points to bear in mind regarding his technic are as follows: Iodine or potassium iodide is used in cases of arthritis, joint involvement and infections, as a solvent. Where pain exists, calcium chloride, 1 percent, is his drug of choice. A few examples as to exact application follow:

Sciatica.—He applies the active electrode over the nerve roots, using the positive pole, the gauze beneath the electrode being previously saturated with a 1-percent solution of calcium chloride. The inactive electrode is placed over the inguinal region. Duration of treatment is half an hour; amount of current, ten milliamperes. Treatment is given daily for six days, then three times a week until a course of fifteen treatments has been given. Discontinue for a week. If there is no improvement he applies the negative electrode over the eyes instead of the inguinal region. The reason for the latter technic is that the eye, being largely fluid, conductivity is better. The dose is, roughly, 5 milliamperes.

From a historical point of view it should be said, parenthetically, that *Hôpital Salpêtrière* derived its name, when first constructed, in 1608, from the fact that it was here that gunpowder was made. In 1870, Louis XIV converted it into a hospital and a part of it was used as a prison for prostitutes.

It was likewise in this same hospital that Dr. Duchenne de Boulogne (1806-1875) made and used successfully the first faradic apparatus for the testing of nerve reflexes. It was this same Dr. Boulogne who was associated with Charcot, his colleague and co-worker in the same hospital, in neurologic work. It was about this time that Charcot, with his thousands of cases, principally prostitutes who were prisoners, did



General Irradiation with Finsen Lamps.

the excellent work on the disease which bears his name.

Dr. J. Beloit, Hôpital St. Louis, Paris

To pass on without devoting some space to the work at the *Hôpital St. Louis*, under the direction of Dr. J. Beloit and his able co-worker Dr. F. Lepennetier, would be unjust to those who are interested in this work. Here, excellent work is being done with massive doses of x-rays, in deep-seated, and small doses in superficial malignant tumors. Their work includes the use of other agencies, such as phototherapy,

galvanism, ultraviolet radiation, both from mercury-quartz and Finsen arc lamps, as well as diathermy.

Their technic, briefly, follows: In deep-seated malignant disease, the technic is: Filter, copper, 1 mm., aluminum 2 mm., and wood 18 mm., in the order given, the skin being next to the wood (or card board paper); distance, 20 to 40 cm.; time, 20 minutes; dose, 200 kilovolts.

In superficial epithelioma, as on the face or lip, they use no filter. The distance, in this type of case, is 3 inches (7.5 cm.) from end of a 12-inch (30 cm.) cone; dose fifteen K.V. The reason for using no filter is because, when one is used, there is an aggravation of the disease instead of improvement in the condition. One treatment is all that is required on the superficial cases.

Much stress is also placed on the use of galvanism in cases of various nerve involvements. The type of apparatus used is the wall plate. Diathermy (medical), phototherapy and ultraviolet rays are all used in conjunction, where indicated.

Dr. A. Rollier.

Mme. Curie's Radium Laboratories, Paris

The next place visited needs no preface nor introduction to the American physician—the laboratory of Madame Curie, at the Paris Institute of Radium, where she and her late husband, Pierre Curie, astounded the entire medical world with their brilliant achievements in the discovery of radium. As is well known, Pierre Curie was killed by being struck by a horse-drawn vehicle, only a short distance from his laboratory, some fifteen years ago.

The laboratories, as they are today, are more interesting to the pure scientist than to the physician. Innumerable, highly complicated and technical apparatus are everywhere in evidence. The massive machinery for measuring the speed of the alpha ray, bending it, etc., and others for making a toy out of the ultraviolet rays, can only cause the physician to gaze at these things profoundly awestricken.

Dr. A. Rollier, Leysin, Switzerland

Establishing his clinic in 1903, in the Swiss Alps, Dr. Rollier has given the world ample proof that the sun and the air of high altitudes will produce cures that can be neither equalled nor surpassed by any other known methods, in all forms of surgical tuberculosis. His treatments are based on his own findings that tuberculosis of a part is merely a local manifestation of a systemic condition—a general disease involving the whole organism.

He exposes the entire body to the rays of the sun, beginning by acclimating each patient by fractional radiation, the feet first, including, at successive treatments, the knees, thighs, abdomen, thorax, etc. and carefully noting any idiosyncrasy or untoward symptoms in each case, until at last the patient spends several hours daily with his nude body exposed to the sun and air at an altitude of 4,700 feet above sea level. At such an elevation the layer of moisture, dust and smoke which constitutes what one physician described as an "atmosphere of slime", as found in low altitudes, is wholly eliminated and all the rays of the sun, both visible and invisible, are able to reach the patient.

His work daily proves that, by the combination of atmospheric and solar action on the nude body, the vital energy is restored to the organism, the skin being returned to its natural medium—sun and air—of which it has been deprived too long.

Dr. Rollier's First Clinic at Leysin (1903).

Dr. O. Veroguth, University of Zurich, Switzerland

A very interesting clinic is that at University of Zurich, where Roentgen was a student. Dr. Veroguth combines internal medicine, surgery and physical methods and uses any one or all three, as may be indicated.

One example worth mentioning here is that of a woman, age 40 years, unable to walk, with loss of control of bowels and bladder. By lipiodal injection, he found that the disease extended from the second to the ninth dorsal vertebra. He performed a laminectomy, removing the laminae of the second to ninth, inclusive, where he found a fibromatous condition. The pressure being removed, the function

Sun and Work Cure. Rollier Clinic. (Note snow on the ground).

of the parts previously involved began to return. X-ray therapy, with movement of the limbs by the patient, followed by sinusoidal and galvanic currents, completed the treatment in this case.

Dr. Veroguth is a staunch advocate of thermal, chemical and mechanical currents, as well as of hydrotherapy, x-ray therapy, etc.

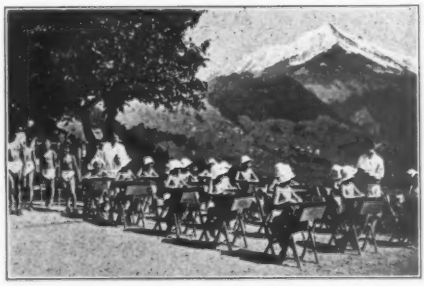
Dr. Josef Karwarschik, Hospital of the City of Vienna

Very interesting and instructive is the work of Dr. Karwarschik, combining galvanism, faradism, hydrotherapy, diathermy, ultraviolet radiation, penetrative or radiant light, infrared rays, massage, internal medicine and surgery.

The high points gained at this clinic were his technic in pelvic diathermy, with a vaginal electrode and a belt of block-tin about the hips, the current averaging 1,500 milliamperes, for a duration of 20 to 30 minutes.

In his galvanic treatments, in trifacial neuralgia, he uses a "goose foot" electrode over the three branches, with the indifferent electrode between the shoulders, the dose being 10 to 20 milliamperes.

In sciatic involvments he uses two pieces of block-tin, three inches wide and sufficiently long to reach from the spinal exit of the sciatic nerve to the ankle. One



Open-Air School, Rollier Clinic.

electrode is placed on the back of the leg, over the sciatic nerve, the other on the front. Under these electrodes he places twelve thicknesses of bath towel, since his current, in such cases, is pushed as high as 150 milliamperes.

Including a department for old men, there were 6,000 patients in this hospital, which is very efficiently managed by its director Hofrat Dr. Arnold Baumgarten.

Dr. Eugène Steinach, Vienna

After having been received by Dr. Steinach and having grasped his own ideas of his vasoligation operation, I have deduced that the following is correct: He does not claim that his operation, in itself comparatively simple, will or is aimed to restore lost sex vitality, but merely to conserve that hormone which, by nature, is present in that particular individual, be it weak or strong. In other words, his operation is aimed at giving the patient's body an opportunity to become benefited through regenerated, strengthened physiologic tissue, enabling him to regain his resisting powers.

Dr. Otto Kaiserling, Berlin, in his Office.

In regard to those who have done work along similar lines, and as to the lasting effects of the operation, he had this to say, in brief: Benjamin, Cardenal, Eiter, Schmidt and Uspensky have all kept careful check on their cases, and the beneficial effects from the operation last from three to four years. But Steinach warns that, even yet, the combined data of the men who are working along these lines is of no conclusive importance.

His work in vasoligation began about seven years ago, and it is by no means a rarity to have many of the patients who are still improved, according to the Doctor's statement, call to see him. He gives Dr. Chas. Chetwood much credit for his valuable data as to lasting results, but he emphasises that the period of observation is too short, as yet.

Apparently the whole aim of Dr. Steinach, by unilateral or bilateral vasoligation, is merely conservation of hormones and graduating the endocrine impulse, thereby extending or distributing the effect over a long period of life.

In the younger man, unilateral ligation is the rule, especially with those in whom *potentia generandi* must be preserved. Should the effects begin to abate after a few years, the operation may be repeated on the opposite side.

There is one operation in which I shall g i v e his technic briefly. This he calls **abugineatomy.**

To increase internal secretion, in patients who have had a bilateral vasoligation and whose strength is failing, Dr. Steinach operates as follows: Make a small opening in the scrotum; expose the testicle and have an assistant keep it in position; select a place in the tunica albuginea having few blood vessels and make a 2- to 3-cm. incision, whereupon a small piece of testicular substance will protrude. This piece, about the size of a date kernel or small olive, is carefully trimmed away with scissors. Wait a few moments for parenchymatous bleeding; if it occurs, arrest it and close the albuginea with a fine needle. He requires ten minutes for the operation, under local anaesthesia. The patient may get about in a week.

What are the biologic consequences? The tightly-stretched albuginea keeps the entire convoluted mass of the seminiferous tubules under pressure. When pressure is removed, the tubules separate a little, the interstices enlarge, and their enlargement causes an extension and proliferation of the interstitial cells. This process extends over the entire testicle, without causing even transient disturbance in the spermatogenis.

Mechanotherapy Room, Kaiserling's Clinic.

Dr. Franz Nagelschmidt, Berlin

The clinic of Dr. Franz Nagelschmidt is as interesting as the man himself. Dr. Nagelschmidt is a happy combination of an outstanding physicist, electrotherapeutist and inventor, as well as being a thoroughly practical physician and teacher.

The first diathermy machine ever constructed, which made possible the socalled discovery of its method of application, is to be seen, still in use in his clinic. This old machine, which he first demonstrated in Dresden, in 1907, and later in London, at St. Bartholomew's Hospital, Dr. Nagelschmidt intends placing in a museum some day.

As to the methods used by Dr. Nagelschmidt, it is somewhat difficult to enumerate them, much less to describe the technic, due to lack of space. A brief general description of his methods follows:

Neon light is one in which there are no ultraviolet and no infrared rays— a perfectly cold ray. This he uses in inflammatory conditions, such as boils, carbuncles, phegmon, etc., for twenty to thirty minutes, repeating daily, as indicated.

Ultraviolet rays, faradism, x-ray therapy, desiccation, coagulation, medical diathermy, radium and radium emanation, the latter both intravenously and by mouth, he uses where indicated.

In treating pneumonia with diathermy, his results are well worth mentioning. In many cases he gives as high as 1500 milliamperes, for one and half hours, the electrodes being placed front and back, with the involved area between, repeating twice daily, as may be indicated.

In tonsil coagulation, he prefers leaving some healthy tonsil tissue, unless the patient insists on complete destruction. His reason for so doing is that it is his belief, with which many of us thoroughly agree, that a healthy tonsil performs functions necessary to the body.

There is one machine in his clinic that, as yet, he himself is unable to describe. It is neither galvanic, faradic nor sinusoidal, but it is most nearly an interrupted sine. This he uses in all cases of infantile paralysis and other paralytic conditions, as a nerve tonic, as an obesity reducer, etc. Muscle contractions, as strong as may be desired, may be obtained with this apparatus without the skin or tissue irritation found in using faradism, galvanism or the sine wave.

Dr. Otto Kaiserling, Berlin

Dr. Kaiserling's Diagnostic Institute of Brotherhood, of the City of Berlin, is a unique institution, so far as the American physician is concerned. One might compare it to our mine or contract practice, our compensation laws or to some of our fraternal benefit orders. The employer pays three-fifths of the cost of the treatment or service rendered and the employee the other two-fifths. All services have a set price, which is arranged by a non-medical board. For example, a medical diathermy treatment costs one mark and fifty pfennigs, or about thirty-seven cents in our money. An x-ray picture costs about eight marks, or approximately two dollars.

There is a central hospital and executive building combined, elaborately equipped with mechanical, electric and hydrotherapy apparatus, a drug department, operating rooms, x-rays, light, etc. This establishment represents the best combination of

Quartz Lamp Room, Kaiserling's Clinic.

internal medicine, surgery and physical therapy that I have ever had the opportunity to inspect.

It might interest the reader to know just how the practice of medicine in Germany is conducted. Briefly, it is this: There are, roughly, two classes of physicians: the men who are nationally or internationally known, such as Nagelschmidt, who is able to command fees such as those of our leaders in America (this type constitutes forty percent of the physicians); and the other physicians (sixty percent), who may and usually do place their names on a register, signifying that they will make calls on the poorer people, in which case the physician cannot charge in excess of the regular schedule price, set by a non-medical board, where the fee for a call or given type of treatment may be as low as twenty-five cents. Incidently, the physician, when called, is compelled to render service. The same applies to the physicians of Austria.

Any physician who has read this article has, by this time, made many deductions, comparisons, etc., and has probably arrived at his own conclusions as to the great or small amount of virtue possessed by the various men herein mentioned, and their work. Personally, I am reminded of a dozen or more strong men starting on a long journey to the same destination, but each by a route somewhat different from the others. They succeed in reaching their destination. So it is with these men in their clinical work. Rollier is favored by natural facilities—by altitude where he has the very important advantage of p u r e, fresh, uncontaminated air, together with all the rays of the sun's spectrum, sufficient to assure his 3,500 patients that ray-filters, such as dust, smoke, fog, etc., are wholly eliminated.

Knowing that he possesses possibly the best of all methods for his particular specialty, surgical tuberculosis, he sticks at it and refuses to complicate matters by adding artificial means, with less virtue, which are necessary to those physicians who are not so fortunately located as he is. His work is a monument to him and to the entire medical world.

All of the others have more in common, but their methods of application may vary somewhat. The various methods consist simply in using, singly or combined, all of the following: galvanism, faradism, internal medicine, surgery, medical and surgical diathermy, static electricity, tungsten, mercury-quartz and Finsen arc lamps, radiant heat and light, phototherapy, infra-red rays, radium and x-ray therapy, fresh air, dietetics, hygienic and occupational measures.

To recapitulate, it appears that the alert European physician is like our own alert physician, in that the sum total of the practice of medicine is attention to the following: (1) Removal of infections, by whatever methods seems best; (2) the endocrines; (3) oxidation; (4) metabolism; (5) vitamines; (6) diet; (7) habit; (8) exercise; (9) psychotherapy; (10) mechanical therapy; or, to sum it all up still more briefly, Internal Medicine, Surgery and Physical Therapy.

124 E. Main St.

Physical Therapy, Positive and Negative

By J. C. Elsom, M.D., *Madison, Wis.*
Professor of Physical Education and Physical Therapy, University of Wisconsin; President, American College of Physical Therapy

IT IS quite a long way from the north pole to the south pole. One is positive, and the other negative — plus and minus — with possible emanations from the one to the other, the magnetic needle pointing always to the North. We speak of this difference between the poles to illustrate the meaning of extremes; "As far as the heavens are above the earth" is a similar expression of comparison. Everything has its antithesis. Good is opposed by evil; knowledge by ignorance; certainty by uncertainty.

In physical therapy we have much to do with polarity. The fundamental conception of the galvanic current, for example, is concerned, first of all, with the knowledge of the difference between the positive and negative poles. One is sedative, the other irritating; one acid, the other alkaline; one constricts, the other dilates, and so on. The positive must not be used when the negative is indicated. We cannot safely do guess work with galvanism. Possibly there might be a 50-50 chance of being right, even with guessing; but guessing may be disastrous in any form of medicine or surgery, and therefore in the administration of physical therapy.

The progress of scientific medicine tends more and more to eliminate guesswork. While not an exact science, medicine has steadily advanced from empiricism to established facts. Much progress has, of course, yet to be made; but we are on the way, year after year, and day by day. Scientists are those who seek after the truth; and the path is followed, wherever it may lead. Naturally, with human fallibility, one may get on the wrong path; but the scientist is able, if need be, to retrace his steps, to repudiate a former theory, and to seek another and better road, without prejudice and with earnestness of purpose.

Cults innumerable have arisen, based on false premises, and some have speedily succumbed, like plants withered and devitalized under the sunshine of scrutinizing investigation; but some have persisted for a longer period in the therapeutic garden, watered and fertilized for a time by popular, and sometimes professional, credulity. A writer has recently said, "In the treatment of the sick the attitude of society seems to be largely neutral. It has shown no great reluctance to accept all comers in this field of endeavor, and new schools of healing are given a cordial welcome. The conclusion seems almost justified that society regards medicine largely as a business, and since science is the servant and not the master of business, it not infrequently comes about that science is used merely to bait the hook, or is omitted entirely. The situation is, in many respects, largely American, and we may recall that it was Yankee shrewdness that discovered the wooden nutmeg and the gold-brick, and it was Barnum who proclaimed the 'one-a-minute' birthrate."

Old Superstitions

In days gone by, electric belts, with mysterious construction of metals of supposedly differing electric potentials, were offered for the use of credulous psychopaths, and were worn with great glee and professed amelioration of symptoms, by eager aspirants for relief from a senile prostate, a gouty toe, or an arthritic knee. Horsechestnuts, carried in the right (or was it the left?) trousers pocket, relieved and cured (?) many cases of itching hemorrhoids. Even the rabbit's foot, if procured during the right time of the moon, has assuaged many an ailment and banished many a fear held by dusky sufferers.

Banquo's ghost is not always easy to down! Albert Abrams, a princely master of a monumental fake, with his diagnostic electronic, vibratory, magnetic machine (which worked, by the way, with or without wires), though dead, yet lives. In a newspaper advertisement seen by the writer within the past few weeks, a distinguished (?) and ambitious chiropractor of a Capital city and University town, proclaimed in bold type that he administered (in addition to the other forms of his witch-doctoring), for a modest recompense, the Abrams treatment, and announced his "new and certain electric method" of treating Bright's disease, psori-

asis, halitosis, or what have you? Lydia Pinkham's Vegetable Compound is still leading, with benign efficiency, thousands of ailing, yet hopeful, female patients over the rocky roads of life, whether in youth, middle age, the menopause or even far beyond!

Hundreds of instances of such negative therapy might be mentioned. Many are extreme cases of quackery, some more modest, and others cautiously cloaked in meaningless, indefinite, but high-sounding phrases. Some are even successfully called to the attention of the physician who may specialize in physical therapy; occasionally converts are made, and "modalities" (heaven save the word!) of untried and unproven value may even be exalted to a place in the physician's therapeutic methods. Positive physical therapy may thus be sacrified to negative physical therapy; and the minus pole of the physician's judgment may become unfortunately active.

Here is an interesting quotation from a recent issue of the *Journal of the American Medical Association*, which adds to our knowledge of a certain "Fountain Head" of a form of therapy, born and raised "where the West begins, and in a state where the tall corn grows." The broadcasting station has been recently transmitting, and here is the result of the activity of the electrons, amplified in the plates and filaments of our universal, 6- to 10-tube super-heterodynes, on a wave-length of so-many kilocycles, "by authority of the Federal Radio Commission." No less an authority than our esteemed friend "B. J."—the daddy of chiropractic—has this to say, not over the ether, but in an address to Chiropractors in Philadelphia, on Feb. 26, 1928: "Chiropractic is doomed; you have drifted so far from the basic principles of chiropractic that you have lost your identity and brought the Basic Science Act on your heads. Twenty-eight Chiropractic schools have closed recently, and many others will follow. The Supreme Court in 7 states has handed down legal injunctions during the last 18 months, whereby these states are lost forever to chiropractic. This will probably be the last time you will see me as a chiropractor, as I do not propose to lose good money in fighting against sound arguments." Incidentally, it is said that the number of students in Mr. Palmer's million-dollar school at Davenport has decreased from 3500 to about 300.

These things are signs of the times. The development of physical therapy has been an extremely interesting thing; and remarkable progress has been made, as we are all aware, in the past ten or fifteen years. The chaff is being sifted from the wheat—much chaff—yet there is some which still remains. In this discussion, the chaff is being compared with the negative, or minus, side of physical therapy; the wheat, of course, is that which we seek—the positive in physical therapy. Our ideas may change from day to day; experience and painstaking observation alone will serve as guides to the rational use of physical therapeutic agents. Perhaps, after years of experience, we may discontinue this or that form of treatment, and substitute others. Possibly the over-enthusiasm of yester-year may have undergone atrophic changes; but rational, positive physical therapy remains unchanged in its indications for the relief of many human ailments. Certainly, physical therapy has been removed from the mists of doubt and the clouds of unsavory empiricism and placed in the open sunshine of the general approval of the medical profession. It has assumed a new dress of dignity and importance, especially since the World War. These habiliments of accepted utility will continue to improve, if the physical therapists among us will bring to their work the reasonable and scientific attitude, the open mind, and the professional spirit. "Prove all things; hold fast to that which is good" is very ancient, but very wholesome advice.

Careless Use of Physical Measures

The writer happens to have a friend who purchased, some time ago, a high-frequency machine and an ultraviolet lamp. Others were using these agencies, so why not he? We must keep abreast with the fashion, you know! He was apparently but little interested in the construction of the machines and took but scant trouble to study the physics governing their mechanism, or the physiologic effects which were produced.

He turned the pieces of apparatus over to his office girl, who, fortunately, acquainted herself somewhat with the technic of the application of these agencies. If there happened to be a patient for whom the Doctor could do nothing, or if his diagnosis was difficult, he fell back on the possibilities of the ultraviolet or diathermy, as a kind of last resort — a rather lazy and slipshod method of therapeutic practice. Occasionally there were good results; more frequently, perhaps, no results at all, or even possible harm.

This instance illustrates very well the writer's idea of *negative* physical therapy. There was no reasoning back of the prescription, no exactitude of dosage or careful study of effects, so as to determine indications and contraindications. Physical therapy, to this practitioner, was an inconsequential side-issue, to be tried in haphazard fashion, and applied by untrained assistants and without his personal supervision.

Another illustration, of a different character, might be given of a physician who, after a few trials and after a cursory reading of certain current literature, concluded that ultraviolet irradiation produced splendid results in some of his cases. Becoming by degrees, over-enthusiastic, he soon found himself using the ultraviolet lamp in almost every case that presented itself. In skin diseases, for example, did not some of the text books begin with A and progress triumphantly to Z? Why not ray them all, regardless of color or previous condition? "What's sauce for the goose is sauce for the gander." Thus he argued, with a falsity of premise and with physical therapy, in his hands, sadly negative. Cure-alls have not yet been discovered among physical therapeutic agencies.

In brief outline, let us present some further conceptions of negative physical therapy. Let us take, for example, the vacuum electrode which, in the early days, was activated by a spectacular purple glow, and which could be used on makeshifts of high-frequency machines, costing from ten to a hundred dollars—a bit of therapeutic nihilism. We all remember the flimsy glass urethral electrodes, which could be used only with the prayerful hope that they might not break in their hazardous application. So with similar electrodes for rectal, vaginal and prostatic use—surely, negative physical therapy.

Eczemas, psoriasis and alopecia areata are often apparently benefited by the high-frequency currents and by ultraviolet raying; but to promise a cure for each of these conditions is suspiciously like negative physical therapy.

Diathermy sometimes benefits arthritis, especially the traumatic variety, but hopeful and constant use, in extreme and chronic cases, especially the deforming varieties, approximates the negative side of treatment. Diathermy might, perchance, help to dissolve calcareous deposits, but the writer has not yet been able to produce these uniform and delectable results, in spite of some of the cheerful assertions of the writers of a few of the earlier text books.

Fibrous adhesions around joints are sometimes stubborn things. Diathermy may help to relieve the condition, but passive stretching exercises, with considerable force, and in many cases under an anesthetic, are more clearly indicated. This treatment, followed by diathermy and a daily manipulation to prevent the recurrence of the fibrous formations, seems to be physical therapy of a *positive* nature. When any of the physical agencies, whether diathermy, galvanism, infrared or ultraviolet, fail to produce the desired results, after a thorough trial, it seems unwise to continue their use indefinitely; and yet this is often done, in negative physical therapeutic fashion.

The personal experience of the writer may here be given, in brief outline, of what he considers *positive* (or plus) physical therapy.

Sound Uses of Physical Agencies

1. *Indications for thermotherapy* (conductive, convective and conversive heat): In acute, inflammatory, painful conditions, to relieve pain, increase circulation, increase the absorption of inflammatory products and to prevent stasis; in infantile and other forms of paralysis, to maintain circulation and nutrition; in sluggish ulcers, and infected areas, generally.

For sprains, contusions, fractures, myositis, neuritis, acute or traumatic arthritis, muscle spasm, upper respiratory infections, orchitis and epididymitis, use diathermy; for synovitis and bursitis, diathermy and radiant heat; for erysipelas and herpes zoster, radiant heat and ultraviolet; also as a preliminary form of treatment, preceding massage and manipulation (more or less forcible).

Surgical diathermy is a positive form of physical therapy, undoubtedly. No form of treatment seems so efficacious in accessible neoplasms, whether benign or malignant; but the removal of these growths must be *thorough*. The writer is of the opinion that the greatest advance in the technic and application of diathermy in the next few years will be along surgical lines.

2. *Indications for ultraviolet*: In rickets, and other nutritional disorders, with or without cod-liver oil; as a general tonic, assuming that ultraviolet increases hemo-

globin, red corpuscles, and the bactericidal power of the blood; in local and surface infections, of whatever character, assuming that the penetration of ultraviolet is very slight; and in women during the period of pregnancy and lactation, for its influence on the fixation of calcium and phosphorus in the blood.

In certain cases of dermatologic disorders, for example, *acne vulgaris*, give a full erythema dose at the initial exposure, followed by shorter exposures, both local and general; the latter for the apparently beneficial effect on the glands of internal secretion. The various forms of *lupus* have, in our clinic, shown a favorable reaction, with good results; *eczemas* and *psoriasis* sometimes are improved, but not always; *herpes zoster* has yielded favorably in all the cases which have been given ultraviolet treatment; *impetigo contagiosa* and some cases of *tinea* have been much benefited, but seem to need other medication, in addition; *keloids* have been quite removed in many cases by blistering doses, with the water-cooled lamp, using pressure with a broad quartz applicator and an exposure of from 2 to 5 minutes; *port-wine birthmarks* have not given satisfactory results, as a rule, although most have been much bleached after blistering doses. I cannot claim even an approximation to the success reported by many dermatologists.

3. *Galvanism.* Among the varied uses of galvanism, I wish to point out only a few, which without doubt produce positive results. The slow sinusoidal and similar currents are useful for cases in which muscle and nerve stimulation is indicated, such as peripheral paralyses and in cases of constipation due to muscular atony; positive galvanism for the relief of pain in neuritis, neuralgias, sciatica, etc; the use of straight galvanism for ionization, especially in sluggish ulcers and in many gynecologic conditions.

Lack of time prevents extended mention of the values of massage, active and passive exercises, the various forms of hydrotherapy, or the use of the static current, all of which agencies produce values of a *positive* character. No attempt has been made to give an exhaustive list of all of the conditions which seem to be amenable to physical therapy. The few which have been given, however, the writer is at present willing to classify under the heading, "Positive Physical Therapy." Our opinions should always be subject to change; plus today may become minus tomorrow, or the reverse. Only by experience and constant study may we progress from doubt to certainty.

The exercise of "jumping at conclusions" should not be practiced in the mental movements of the physical therapist. Alert he should always be, but never precipitous, nor yet too slow. It is a fine art to know *plus* from *minus* in any of the valuations of life. To be able to select good from the evil, the certain from the uncertain, and the positive from the negative is a "consummation devoutly to be wished."

Arthritis Treated by Physical Therapy

A Clinical Report on 100 Cases

By Edwin N. Kime, M.D., *Indianapolis, Ind.*
Director, Dept. of Physical Therapeutics, Indiana University;
and
Gertrude Muench, R.N., *Indianapolis*
Chief Technician, Department of Physical Therapy, Robert W. Long Hospital

THE cases to be discussed will be presented in two groups:

Group A. Private cases, under the medical supervision of Dr. E. N. Kime: Thirty-five (35) cases.

Group B. Clinical cases from the wards of the hospital: Sixty-five (65) cases.

The rationale of treatment is based upon the following factors:

1. Joint disease is relatively rare in childhood, due to the greater mobility and use of the joints. As old age progresses, more or less ischemia, anoxemia, decreased metabolism and degenerative changes occur in the synovial membranes.

2. Acute arthritides, whether in the primary state or as exacerbations of an old process, are evidences of nature's compensatory mechanism in the production of hyperemia; this syndrome is usually self-limited and should be carefully kept in mind in all forms of treatment. If the process is already markedly acute, physical therapy is temporarily contraindicated. On the other hand, if the process is quiescent, success in treatment appears to be in direct proportion to the degree in which local hyperemia and motion of the various joints can be effected. Hence vasodilative therapy, plus mechanotherapy, which should include both active and passive motion, should be rigorously and continuously employed, even at the expense of considerable discomfort to the patient.

3. Since the general metabolism is usually low, various methods of increasing it should be pursued, by the use of the various iodides, opotherapy, Morton wave current (uniterminally applied, extremely high tension, oscillatory direct current), light baths, hydrotherapy, diathermy, etc.

4. Although removal of foci of infection is of primary importance, particularly in the prevention of further lesions, favorable prognosis in every case is rather more dependent upon the manner in which the patient responds to a rigorously enforced regimen, in which all the resources of the physician must be utilized, and perhaps all three of the triad of medicine, surgery and physical therapy be brought to bear. Foci of infection frequently overlooked are the pelvic organs and the bowel, and may be corrected by suitable surgery or physical therapy.

Group A: Private cases of Dr. E. N. Kime: Total 35.

Class 1. **Traumatic arthritides.** The main therapeutic indication in these cases is to remove the excessive exudation from the soft tissues within and about the joint. Diathermy alone will not do this, since the arterial hyperemia so induced has a tendency to increase the exudate temporarily.

In these cases the preliminary heat treatment should be applied as soon as possible (within the first few hours after injury, if practicable) and should be immediately followed by gentle massage, manual or instrumental, as by a slow sinusoidal current or, better than all other methods, the Morton wave (socalled static wave). With proper technic, the swelling can be decreased sufficiently to be measurable by the tape line, and the affected part visibly less tumefied. This is accompanied by marked decrease in pain and improved mobility. The joint should then be partly immobilized by some elastic dressing, such as an Ace bandage, and the patient be instructed to keep the joint in motion within the limits of his tolerance to pain. As a rule he will be glad to do this, since the joint feels better if not too tightly immobilized.

Rigid splints—plaster of Paris, adhesive strapping, etc.—are to be reserved only for those cases in which fixation of bony fragments is necessary. Even in these cases, physical agencies should be used at the earliest possible moment consistent with skeletal integrity. By a more universal application of these principles there should be much less disability from postoperative adhesions and the various forms of ischemic

contractures and paralyses so dreaded by the general surgeon.

In this group of traumatic arthritides (total, 11 cases) the results were 100 percent good. They include recent traumatic injuries to various joints, such as the shoulder, elbow, knee, wrist, thumb, great toe, ankle, etc. All were negative to x-ray, but all showed swelling, pain and limitation of motion. The shortest disabilities varied from two to five days, and were seen in patients treated within the first twenty-four hours after the injury had occured. The longest disabilities were in three cases, of ten days, fifteen days and thirty days, all following injuries that had been treated unsuccessfully by other methods and were not seen by the physical therapist until at least a month had elapsed since the original injury.

Class 2. **Acute infectious arthritis.** (Neisserian): Four (4) cases. These cases were all monarticular, associated clinically with a recent or accompanying gonorrheal urethritis, and were treated by diathermy applied to the affected joint. Three (3) were also given diathermy to the seminal vesicles. These three were completely relieved—2 within 5 and 6 days, respectively, and one after 22 days. The fourth case was not so treated, and quit treatment, unimproved, after 4 days. There is a question as to the diagnosis in the fourth case, since experience, as given in the literature, seems to indicate that in gonococcal arthritis, diathermy applied to both the local lesions and the seminal vesicles, is almost specific.

Class 3. **Chronic multiple arthritis, deformans type.** Twenty (20) Cases. Results in these cases are evaluated as follows:

Excellent: Those showing marked objective and subjective improvement.

Improved: Those showing improvement, definite but attributable to something else, such as removal of infectious foci, antisyphilitic treatment, etc.

Poor or failures: Patient either worse or stationary under treatment.

These patients were treated by thermotherapy (chiefly diathermy to the worst joint), followed by some form of electrical stimulation. A few were treated by galvanism and a few by static sparks applied to the affected, painful joints. These agencies appeared to give better symptomatic response than appeared when they were omitted. Patients in whom constipation was carefully treated by colonic injections and by mechanotherapy applied to the abdominal walls did better than those in whom this factor was not considered.

Excellent results were obtained in 12 cases, or 60 percent; cases improved were 2, or 10 percent; poor results appeared in 6 or 30 percent.

The poor results were obtained in persons of psychoneurotic tendencies who had been "dumped" upon the physical therapist after every other resource had been exhausted. One was tabetic, another definitely psychoneurotic, and a third refused to have needed dental extractions performed. In one *amiodoxyl* was used, produced thrombotic lesions in the veins, and gave only temporary relief. Another was unable to cooperate by reporting every other day for treatment, as is necessary in these cases (every day is even better). Another had partial ankylosis of the shoulder joints, which had been present for years, and although distinctly more comfortable after physical therapy treatment, the ankylosis still persisted. However, by rotation of the entire scapula, this patient was enabled to feed herself and to perform various manual movements without discomfort, which had previously been impossible for years.

Group B: Clinical cases, Robert Long Hospital. Sixty-five (65).

Class 1. **Acute arthritis;** 9 cases. Of these 7 were gonococcal and 2 were ordinary acute arthritis. The results in one of the latter were good, and in the other they were poor. The first case had osteomyelitis of the mandible, which was drained while he was in the hospital. He was afflicted with a rapidly migrating arthritis which was symptomatically markedly improved by each diathermic treatment. His good results are perhaps better attributed to the drainage than to any specific effect from the physical therapy. The other case was one of acute rheumatic fever, and became worse during treatment. This patient should not have been given treatment in the first place, since her joints were already hyperemic, and there is danger in this type of case of increasing the likelihood of cardiac damage by physical therapy, too rigorously applied.

The 7 cases of gonococcal arthritis were as follows: 4 acute, with concomitant or recent specific urethritis, and positive complement fixation tests; and 3 chronic, with mild exacerbation.

All of the acute cases obtained excellent results from diathermy applied to the

affected joints, with specific treatment of their urethritis, if present.

The 3 chronic cases all had positive complement fixation tests, one had had arthritis for eight years, with ankylosis of the hips, pelvis, knees and ankles. The x-ray report did not substantiate the diagnosis of gonococcal arthritis, the roentgenologist stating that the degree of pathologic change was not of sufficient extent to be consistent with a specific arthritis of such long standing. Despite removal of foci of infection, sterile milk injections and over a month's daily treatment with physical therapy, he was dismissed as unimproved.

Another case of six months' standing, was improved after two weeks treatment with physical therapy, but was furloughed home and returned for operative treatment of an old gonorrheal stricture. On dismissal there was definite improvement, but continued treatment at home was advised.

Another case, on the border line between acute and chronic, with a duration of nine weeks, a concomitant urethritis, and x-ray examination showing early destructive changes in the wrist joint, obtained marked benefit from hydrotherapy, diathermy to the affected wrist and systemic ultraviolet irradiations. He also received prostatic massage on alternate days.

Summing up the results in this group: Five (5) out of 7 (71 percent) showed excellent results; one was improved; and one (long standing case with deformity) showed no benefit.

Class 2: **Chronic arthritis;,** *without visible deformity.* (X-ray changes, either nil or atrophic, except in the special subgroup of spondylitis. This group, which perhaps belongs to the early deformans type, shows osteophytes, etc. in the vertebra). Total cases, 28; spondylitis, 11.

The age incidence in this whole group varied from 18 to 78 years; the average age was in the late thirties and early forties; and the average duration varied from six months to four years. The average age in the spondylitis cases varied from 33 to 66 years, but the average age was about ten years older than the average of the entire group.

Results from physical therapy in the spondylitis cases.

Total spondylitis cases, 11. Of these 2 died and at autopsy were found to have malignant disease of the spine; one primary (sarcoma); and the other secondary from a retroperitoneal carcinoma(?), primary source not determined.

Of the remaining 9 cases, only one showed excellent results (x-ray showed very little osteoarthritis); 2 showed no improvement (foci not relieved); and the remaining 6 showed definite symptomatic improvement (relief of pain and disability).

Results from the cases of arthritis without spondylitis: seventeen (17) *cases.*

One died of myocardial failure, after a week had been spent in the department. Of the remaining 16 cases, 4 showed excellent results (25 percent); 8 were improved (50 percent); and the remaining 4 were furloughed home or withdrawn for surgery, etc., too soon to obtain benefit. These are listed as failures (25 percent).

Of the 8 cases listed as improved, 2 received amiodoxyl and 4 others had foci of infection relieved during the time of treatment. In only one of the cases listed as excellent results was a focus of infection removed during the time of treatment (tonsillectomy). The foci of infection attacked in these cases were entirely in the head, teeth, tonsils and antra being drained in various cases. Had not operative work been done to cast some doubt as to the reason for their improvement, at least 4 other cases would be classified as excellent, rather than as merely improved.

Class 3: **Chronic deforming** (hypertrophic or atrophic) **arthritis.**

Age incidence in this group, youngest 20; oldest, 74; average age, 41; average duration of the disease, ten years.

Total cases this group, 28; excellent results in 8 (28 percent); results nil in 4 (14 percent); the remainder, 58 percent, were improved. **Amiodoxyl** was used in half (4) of the cases listed as excellent, and in 2 of the cases called improved. From this it may be seen that amiodoxyl is an excellent adjuvant agency, when administered with the proper technic, and that its use does not conflict with physical therapy. However, its use will not serve as a complete substitute for physical therapy.

Nine (9) of the 16 cases listed as improved had foci of infection removed. This complicated the interpretation of the results, but the majority of these patients expressed themselves as well pleased with the symptomatic response obtained as to relief of pain and as to mobility.

Considering the long-continued disability to which they had been subjected by their

deforming disease, the results in those given as excellent were remarkable. These were the patients who were so helpless on admission that they had to be brought to the department on stretchers, and who were able to walk from the hospital on dismissal.

SUMMARY OF RESULTS IN ENTIRE SERIES

Traumatic arthritides: 11 cases (11 percent of total), results all excellent.

Acute infectious arthritis: 13 cases (13 percent of total). Of these, 11 cases were gonococcal and 2 nonvenereal.

Results in gonococcal cases; 8 were excellent, 2 were nil and one was improved. In the 2 nonvenereal, acute arthritides, results from physical therapy were not good.

Chronic arthritis non-deforming: (Of 28 cases, 11 were spondylitis, either alone or complicating the clinical picture).

Results in spondylitis; 2 cases died of malignant disease of the spine; one obtained excellent results; 6 were improved; and 2 were nil.

Chronic arthritis non-deforming and non-spondylitic: Seventeen (17) cases.

Results: One died of myocardial failure; 4 showed excellent results; 8 were improved; and 4 were failures.

Chronic deforming arthritis: Total cases, 48.

Results: Excellent in 20; improved in 18; and nil in 10.

Grand total: Excellent results, 44; improved, 34; and nil in 22. Of the latter there were three deaths; two of spinal malignant disease and one of myocarditis.

409 Medical Arts Bldg.

How to Develop a Physical Therapy Practice

By HALDOR CARLSEN, M.D., *Chicago*
Attending Staff, Belmont Hospital

WHILE physical therapy may be considered a new field in connection with the practice of medicine, to the average physician in the United States, it is an art and a science that has been very extensively developed in Europe. The World War added quite a stimulus to physical therapy and the growth of interest in the subject has been very steady.

True, there are some physicians who still think of this science as an "ism" and ridicule its use, but their only failing is that they lack the proper backbone to go into the subject and try to learn its value in their profession and the good it does to ailing humanity. This is the one reason why so much of this valuable work has fallen into the hands of irregulars who lack the prerequisite foundation for carrying out the technic of this important addendum to our armamentarium. Then our over-conservative men stand aside and criticize that about which they know little or nothing.

A thorough training, a working knowledge of equipment and its varied uses, and proper technic, with a thorough diagnosis, are all essential. Instructors in our medical colleges have given little thought to this subject until quite lately, but it is gradually gaining the respect and interest due it. This is shown by the fact that the fundamental principles of physical therapy are now being taught in our best medical colleges, either as an addition to the regular medical course or as a postgraduate course, for men already established in general practice.

Many of the every-day conditions with which a physician comes in contact may be greatly benefited if he has the proper knowledge of the uses of physical therapy. Many old chronic conditions, which have been "going the rounds" and have seemed hopeless, have been greatly benefited by this means. Time in restoring function has been materially reduced.

To summarize, one's foundation must be built upon:

1.—Examination.
2.—Diagnosis.
3.—Equipment.
4.—Technic.
5.—Results.

FOUNDATION AND TRAINING

For a good superstructure, a proper foundation is necessary. A modern physician

has had the proper requisites in the practice of medicine and surgery. In developing a physical therapy practice, one may ask: "How can I obtain the required knowledge to do this work intelligently?"

Besides the work one may get as post-graduate courses, many good books and much current literature may be had to study some of the fundamental principles of physical therapy. Some of the reliable manufacturers will give symposiums on the mechanics of the several appliances. It is worth one's while to review some good works on physics, dealing with light, heat and physico-chemical reactions, to be able to appreciate the scientific application of physical therapy. Special courses are arranged from time to time and one is also sponsored by the American College of Physical Therapy each year for such instruction.

Besides knowledge, one needs practical training. This can be acquired by doing things for oneself, and thus learning one's shortcomings, by failure to get results. Get into the workshop of some good man, when possible, to learn methods of application.

Diagnosis

Before attempting to treat any condition with the aid of physical therapy, be sure that you have a detailed history of this condition. Make a complete physical examination, and never lose sight of the value of laboratory findings, such as uranalysis, chemical and microscopic, and, if you do not do this work yourself, be sure that it is done by a reliable laboratory or technician. A complete blood examination may be of great value for some forms of treatment.

One important point that should be emphasized in the treatment of joints, bones, chest or gastrointestinal cases, is; should there be any questionable pathologic condition, do not fail to make use of the x-ray or the fluoroscope in confirming your diagnosis. I have seen much harm done because some physicians have been too positive on ordinary clinical findings, without a check-up before treatment. Many chest affections, with history of old bronchial conditions, need careful differentiation between incipient, active or passive tuberculosis. For example, it is considered inadvisable to treat an active tuberculosis or diabetes with the mercury-quartz lamp. In abdominal conditions, be sure to make an accurate diagnosis of gastrointestinal affections, and be on the lookout for such conditions as ulcers or malignant disease that may be in the latent stage. Without an exact diagnosis and a knowledge of actual conditions, the application of physical therapy may do a great deal of harm.

Never treat a condition with physical therapy alone, when the diagnosis calls for medicine or surgery. Failure to observe the foregoing rule will make you an easy target for critics, placing you in the class of those who try to do something that they are not qualified to do (the quacks), and bringing physical therapy into disrepute.

Equipment

Do not purchase a great deal of apparatus when you are just starting out. Figure carefully, that you may know just what you want and what you will have actual use for. Do not be misguided by a salesman's talk of the monetary value of this and that form of equipment, before you have truly familiarized yourself with a fair working knowledge of it. Be sure that you are thoroughly acquainted with the class of conditions that you can successfully treat with the aid of each particular agency. Then purchase your equipment only from some good, reputable concern, whose years of experimentation and research have enabled them to produce a machine or machines that render best scientific results. The reports of the Council on Physical Therapy, of the A.M.A., will be helpful here.

When you realize that you have a sufficient number of cases to warrant purchasing additional equipment, familiarize yourself with this new apparatus and do not merely make a purchase for the sake of an impression; because, if you do, your are wasting money and acquiring only dust-gatherers.

If you wish to develop a successful physical therapy practice, you must know when and how to use the means at hand, so that you can produce the desired results and such as will compensate you for the outlay of time and money expended. Your equipment constitutes your working tools, and if you do not understand how to handle these tools with certaintly, you can not expect to do good work and get good results. Having much equipment not in actual use would be equivalent to having many useless tools. Do not expect your physical therapy equipment to act as a magical wand, but if it is used intelligently it will be the means of assisting

you to obtain quicker and more satisfactory results.

Under equipment one must consider:

1.—*Diathermy* (Our means of developing heat within the tissues).

2.—*Galvanism* (Our only truly direct, chemical current).

3.—*Sinusoidal or Wave Currents* (Our mechanical means of muscle stimulation and exercise).

4.—*Ultraviolet Radiation*, from either mercury-quartz burners or the carbon arc lamp (The shortest wave lengths of our spectrum).

5.—*Infrared* and *Radiant Light*, for producing surface warmth with a limited amount of penetration.

6.—*Hydrotherapy*, with its many divergent methods of application.

7.—*Mechanotherapy* and *Massage* (Our means for hand or mechanical stimulation).

Technic

For successful results you must have a good working technic, including:

A. Proper training of yourself.

B. Efficient, trained assistants or technicians.

C. Proper layout of your rooms.

D. Cleanliness and sanitary surroundings.

E. Properly kept reports and records.

You cannot control any work or organization without yourself being properly trained. Then, and only then, are you able to direct your assistants (if you have any) on what and how to do the work. You should always supervise treatments and be posted as to the results obtained, and when these are not forthcoming, you should go over the work *yourself*, as you may have to change the method of treatment. One must remember that the same technic used will not always give the same results in all cases, even as drugs do not react alike in all individuals. Therefore, if a patient claims he is not getting results—*investigate*.

Your rooms for treatment should be arranged for the comfort of the patient, as regards light and ventilation, and must be accessable for your technician to work around the patient with the least loss of time.

A sufficient amount of clean linens should at all times be at hand. Paper or linen towels may be used at your own discretion. Sufficient sizes of gowns should be available.

All pads, applicators or electrodes should be properly cleansed after use, before using them on the next patient.

It is advisable, especially after external treatments with heat or some forms of light therapy, to bathe the patient with rubbing alcohol, for his comfort. Often a little toilet powder, added afterwards, makes a patient feel refreshed and eager to come back for the next treatment. This not only has its therapeutic value, but also a psychologic effect on the patient.

Do not trust to memory. Keep records of what has been done, so that you may compare your results and save time on the next treatment. Do not fall into the habit of some men who ask the patient, "How did I treat you the last time". That is what the patient is paying you for.

Properly kept records are part of your assets in your future work, and for a successful practice. These records may be made up to suit the individual needs, or standard forms may be used. But by all means keep some form of records and *keep them up to date*.

If you have technicians, instruct them, when they encounter conditions that may be questionable, to be sure that they consult you first, before proceeding with the treatments.

In some forms of treatments, especially in autocondensation, the patient should be allowed to rest sufficiently before going out of your office, to avoid occasional unpleasant results.

Be careful not to treat pus cavities without first securing proper drainage.

Removal of all clothing and the use of a gown, especially in some forms of heat or light therapy, is essential for satisfactory results and for the patient's comfort.

I shall not endeavor to state any particular forms of technic, as a method which succeeds in the hands of one man may not work out successfully in the hands of another. A proper knowledge of the fundamental principles in the use of any particular agency or appartus is the basis upon which you must work out a proper technic. Neither will I attempt to explain at this time why certain results are obtained by the use of any particular current or agency, as this must be worked out personally in treating each individual condition. Learn some form of good technic, and so long as you get good results, stick to it until you are convinced that you can improve by changing. "Hold fast to that which is good."

SUMMARY

1. Do not be guided entirely by claims of results made in the literature of the manufacturers.

2. Remember, physical therapy is not a cure-all, but *one* of the means by which you may get surprising results, in conjunction with medical and surgical treatment, and also when medicine and surgery are of no avail.

3. Time is an important factor in many forms of treatment and if you feel that you cannot allow yourself that, then do not blame any one but yourself if you do not always get the desired results.

4. Applications of various forms of physical therapy play an important part, for the man in general practice, specialist or surgeon.

5. Do not be led to believe that, by equipping your office with physical therapy apparatus, you will be able to apply its uses without the proper training of yourself.

4747 Milwaukee Ave.

The Diagnosis and Treatment of Sacro-Iliac Strain

By FRANK H. WALKE, M.D., *Shreveport, La.*
President-Elect, American College of Physical Therapy

SACRO-ILIAC strain is very common, yet it is frequently overlooked by the clinician, because the proper emphasis is not given the examination of patients complaining of backache. This is a frequent ailment, and the average doctor attempts to treat such conditions without a proper examination or history. "Uric acid" or "rheumatism" is given as the cause, and medical treatment is given for relief. However, if a proper examination were made, many cases would be found to arise from the sacro-iliac joints, in the form of a strain or subluxation. The nomenclature is not agreed upon by the various authors; some speak of this condition as "strain," "subluxation", "relaxed," "separated," or "dislocated" sacro-iliac joint. However, "sacro-iliac strain" is most generally accepted in the literature.

Sacro-iliac strain is a subcutaneous injury to the soft parts about the sacro-iliac joint. The injury may be so slight as to escape the patient's notice, but careful inquiry will generally cause him to recall such trauma. A history of an awkward step, a trip on the sidewalk or stairway, a heavy lift, such as moving furniture, etc., or direct injuries to the lower part of the back, certainly warrants an examination of the sacro-iliac joint, if backache is the chief complaint. Other causes might also be mentioned, such as pregnancy and long tedious labors, intra-abdominal tumors, straining at stool by constipated patients, long-continued sneezing, as in hay-fever, etc.

ANATOMY

Before discussing the symptoms and treatment of this condition, it might be well to review the anatomy of this joint, with the idea of fixing certain facts in mind, with reference to treatment.

The joint is formed by the articulation of the sacrum with the ilium. The articular surfaces are covered with hyaline cartilage and are held togethed by extensive ligaments. The anterior and posterior sacro-iliac ligaments stretch across the front and back of the joint from the sacrum to the ilium. The posterior ligament is strong and powerful, while the anterior is weak. The ilio-lumbar ligament extends almost horizontally, laterally from the tip of the transverse process of the fifth lumbar vertebra to the inner tip of the crest of the ilium. The sacro-tuberous ligament is attached medially to the posterior, inferior iliac spine, to the posterior surface of the transverse tubercules and sides of the third, fourth and fifth sacral and coccygeal segments. It passes distally and laterally to its attachment on the medial side of the tuberosity of the ischium. The sacro-spinous ligament is a triangular ligament attached by its base to the lateral margins of the sacrum and coccyx, and by its apex to the ischial spine. Thus the joint is vulnerable from four directions in regard to its ligaments, and from two directions in regard to its cartilage, which may account in a measure for so many painful backs.

The sacro-iliac joint, while well pro-

tected from a bony standpoint, is not so well protected from a ligamentous standpoint. Its ligaments and soft tissues are subject to strain, due to the peculiar position of this joint in the body. This joint supports the weight of the trunk and also absorbs the shocks from the lower extremities. It holds the key position when one is lifting, bending, stooping and walking, It maintains equilibrium and balance, and compensates for any awkwardness or undue strain inflicted either by the trunk, while lifting, or by the lower extremity, when walking.

Symptoms

The symptoms of sacro-iliac strain are pains in the back, of sudden onset, following some sort of trauma. The pain may radiate from the synchondrosis down along the thigh, or upward into the lumbar region. Those cases which are due to perceptible trauma may show swelling and discoloration at the joint, while pronounced ecchymosis is present in some.

Limitation of motion of the lumbar spine is a most common symptom. The ilium may be tilted and, if such is the case, all of the weight will be directed to the good limb and the painful one is held bent at the knee; there is always a tendency to favor the injured leg by standing on tiptoe or putting the foot on the rung of a chair, stool or rail, so as to relax the psoas magnus muscle on the affected side, which affords some relief.

Tenderness over the joint is present on pressure, and the adjacent muscles may be rigid. Bending the body, either forward, backward or laterally, aggravates the pain. It is difficult for the patient to pick up an article from the floor, and in regaining an upright position the hands are placed on the thighs for support.

In the acute or recent cases the patient shows symptoms of exhaustion in the form of labored breathing, sweating, irritability and nervousness. There are other symptoms, such as shortening of one leg, a peculiar attitude assumed when lying in bed, when in a sitting position or while walking or standing, and abnormal mobility; but the most characteristic symptoms are *pain* and *limited motion*.

Examination

For the examination of sacro-iliac injury, all the clothing should be removed. The patient should be examined while walking, standing, lying prone and in the supine position. Inspection will show an abnormal attitude, limitation of motion, deformity, swelling, spasm and discoloration. Palpation will determine the amount of tenderness, muscle spasm and swelling. Manipulation will cause pain and will reveal leg shortening, if the patient is lying on his back and both legs are brought together and compared, one with the other.

The x-ray, unfortunately, does not help in the diagnosis of sacro-iliac strain, except to rule out some other condition, such as fracture, caries or osteomyelitis. An x-ray, negative for anything else, is usually a good indication of sacro-iliac strain, in the presence of suggestive symptoms.

Sacro-iliac strain must be differentiated from sciatica, lumbago, arthritis and neuritis. Focal infections may cause pain in the sacro-iliac region. Tuberculosis and syphilis must be excluded, as well as any intra-abdominal conditions or congenital abnormalities.

Treatment. Physical Therapy

The treatment of sacro-iliac strain can best be instituted with the use of physical therapy. All cases, recent or otherwise, demand some form of heat for relaxation. Infrared irradiations, for forty-five minutes to an hour, will give marked relief. Should the ilium be tilted, and should one leg be longer than the other, reduce this by the proper method.

There are several ways to manipulate a sacro-iliac joint, and this must be done in the manner indicated. The patient may be placed on the abdomen, both hands of the operator placed on the ilium and force applied in the direction of reduction. Another way is to lay the patient on his side and do a "shoulder-ilium reduction." A third way to reduce the subluxated joint is to have the patient lie on his back and reduce the longer leg.

The best maneuver for this third method is to have the patient lie on his back, with an assistant to hold the "short" leg to the table, so as not to bend the knee. The operator then takes the "longer" leg, flexes it on the thigh, the thigh on the abdomen, and with one hand lifts up the tuberosity of the ischium, at the same time the leg is in its extremest flexion. Then slowly bring the leg down, in an abducted rotation, to the other leg on the table. If this last maneuver is carried out correctly, both

legs will be the same length. These reductions are always made after the application of heat, for heating relaxes the tissues and reduction is made easier.

Those cases which do not yield to infrared will be benefited by diathermy, using a large block-tin electrode on the abdomen and a smaller one over the painful area, the patient lying face downward on the table.

There are cases which do not improve with either infrared or diathermy, and which are treated with galvanism, using the negative pole over the painful area and the positive pole down the thigh of the affected side. Following this, the rapid sinusoidal current is applied for a few minutes, without changing electrodes.

Another treatment is heating with infrared; then giving the high-frequency effleuve, with the Walke graphite electrode, followed by mechanical vibration. It is always well to use a combination treatment if the patient does not show immediate improvement, because some yield to one treatment and others to another.

Strapping for sacro-iliac strain is not necessary in all cases. Preferably, do not strap except in cases where there is direct trauma and the muscles of the back are also injured. In such cases, apply infrared, then strap, but only for three days; then remove, and do not re-apply.

In the socalled chronic cases, galvanism and vibration, along with a belt, are very helpful. A belt made of three strips of elastic sewed together and made to fasten in front, with buckles which fit snugly about the pelvic girdle, is very comfortable. Truss elastic is pliable enough to give to some movements of the body, but will serve to hold the joint with a minimum amount of motion.

There are also cases of painful sacro-iliac joint which are due to faulty posture. Evidently these cases had a sacro-iliac strain in the beginning and have assumed the faulty posture in the hope of lessening the back strain. These are purely orthopedic cases and must be treated as such.

SUMMARY

Sacro-iliac strains are common injuries, frequently overlooked.

The cardinal points in diagnosis are pain over the sacro-iliac joint, limited motion, and leg shortening.

The most effective treatment in the hands of the surgeon is infrared irradiation and reduction. With the application of physical agencies, radical surgical treatment is generally unnecessary.

Ricou-Brewster Bldg.

Physical Therapy Errors

By WILLIAM A. LURIE, M.D., *New Orleans, La.*

ARE WE expecting too much of physical therapy? Is time going to prove to us that, in treating illness and disease by physical measures, we are not to succeed? That the last recourse is medicine and surgery? Perhaps. There is nothing like failure, and repeated failures, to discourage one in the practice of the healing art. There is no denying that the road to success in the treatment of many of the diseases that have been conquered has been a hard one and marked by innumerable failures, both by those who were ultimately successful and those whose failure left behind monuments of effort to their memory. The glory of sudden evolvement of a treatment for any disease has been the lot of very few.

Let us consider the various means of physical treatments and discuss why they fail, if they do. We must, however, realize that treatments by physical measures, as practiced to-day, are the results of the modern interpretation of the oldest natural forces. Like the interpretation of any thought, force or symptom, they are subject to many variations, before a standard or average can be determined.

Physical measures are Medicine's reaction to the urge of the day. We are now living in an age, the keynote of which is speed. Although we may live the allotted "three score years and ten", we can crowd into our lives more than our forefathers could have done in the lifetime of a Methuselah. The urge of the age is speed. So too it is in medicine. Get the patient well quickly or heal the wound with the least possible loss of time. Is it any wonder therefore that, as physicians, we try to keep pace with

other branches of science, and take advantage of the discoveries in other directions to help heal the sick? Electricity is the giant power of this age, so it is being harnessed to produce newer means of healing. From it we develop the two chief agents of healing, light and heat.

Light and heat are perhaps the oldest known remedial agents. Perhaps heat, as a therapeutic agent, antedates light, for it was the product of the first effort of man's ingenuity.

The more recent studies of therapeutic agents have disclosed that the wave force we term light is composed of more than the visible spectrum. In the study of the component parts of the spectrum we learn that the shorter wave lengths are cold and the longer wave lengths are warm. So, in the consideration of light as an agent for treatment, we have come to learn that we can use the light waves variously. Much of the therapeutic effect of solar light is due to almost imperceptible heat. Heat waves are perhaps the more penetrating in their immediate effect than are the simple light waves.

Light

Let us consider the failures of light waves as a therapeutic agent. We must all admit that the alkaloidal principle of a drug is different in its action from the drug itself. When we speak of light waves, we refer to them as a single therapeutic entity. Most light-productive apparatus develop waves of a definite spectral position. Therefore, in the consideration of their therapeutic effect, they must be thought of as would the alkaloidal principle of a drug; that is, stronger in some directions, and weaker in others. There are times when the active principle of a drug is indicated, and others when the unrefined herb should be used. This is true, also, with light waves.

At one end of the great spectral band we find the very short waves which produce effects of radium and roentgen rays; then the less destructive rays of the upper and lower ultraviolet group; and further along, the stimulating and then the sedative groups of the visible spectrum—the chemical rays—and then the longer wave lengths of the red and infrared group which produce heat. The Millikan or cosmic rays, and the Hertzian or radio waves, which belong to the upper and lower ends of these groups of radiant energy, are not at present used therapeutically, and are mentioned only to record their presence.

It is an interesting fact that the rays at either end of the spectrum are more actively destructive than are those of the near-visible spectral positions; the red more actively so than are those at the violet end. Light, therefore, contains destructive wave forces, which must be taken into consideration.

The one outstanding reason for failure of light therapy is perhaps because we are not sufficiently learned in the action of the different wave groups, their therapeutic development and their recognition. In other words, we lack knowledge of the selection of the active principle or the whole drug, for use in the specific case. As evidence of our increasing knowledge, consider the combined uses of radium, the x-ray and the ultraviolet ray group, to emphasize some specific effect, or to retard the action of one group in one or the other direction.

We must again mention the effect of heat as an adjunct to light therapy. Many treatments by light are preceded by treatments with heat from special generators for that purpose, so that, even previous to x-ray, radium or ultraviolet radiations, the parts are subjected to heat.

The use of the solar spectrum, or sunlight of solar origin, employs all the various groups of light waves in their natural mixture. To use wave forces as generated from any artificial source is to use only a defined group of rays. Each group has a specific action. Thus we have light wave forces emanating from radium, which have a well defined effect on tissue; next are the x-ray group, with lesser power of penetration and not quite as actively destructive as are those of radium; the ultraviolet rays are still less destructive and less penetrating than are those of radium and the x-ray. There is, therefore a greater margin of safety in the administration of treatment by this group of rays, and their effectiveness is augmented by the chemical reactions their application may stimulate.

At the other end of the spectrum, the red and infrared rays, of themselves, are not very penertating, but the conversion of their force into energy produces heat, which is quite penetrating in effect.

Perhaps one of the greatest fallacies in our therapy with light waves rests on the fact that, when we consider light waves as our therapeutic agent, we do not determine the need of the specific case under treatment and use for it the group of rays having the therapeutic effect we desire. Thus, in ultraviolet radiation alone, there are three types

of generators, each of which produces a group of rays different in action from the others. They deliver ultraviolet rays of different wave lengths, having individual and peculiar qualities. To use but one lamp in all types of cases where one wants to use ultraviolet radiation, is to fail to get results; or to try to get a great variety of results from one lamp is hazardous. At all times, the conversion of the energy from light generators produces heat. This is, of course, greater in the light apparatus, which produces the longer wave lengths.

Heat

All authorities on physical therapy recognize three types of heat: *Conductive*, which follows the conduction of heat from a body of higher temperature to one of lower temperature; *convective* heat, which follows the alteration of the energy which produces heat when projected upon an area from some distant generator; and *conversive* heat, which results from the actual passage of energy through a resistant substance or portion of the body, converting that energy into heat.

In illustration of these various types of heat we have the conductive heat from a hot-water bottle or other previously heated substance, placed about the body area we wish to treat. In these instances the heat radiated from the hot body has a therapeutic effect by causing a surface congestion—a dilatation of blood-vessels. There is no need to dwell upon the effect of the hot water bottle as a local analgesic, the hot pack as a sudorific, nor the hot tub to relieve an embarassed circulation. These are common illustrations of conductive heat. In other words, this character of heat results by virtue of contact, much as the heating of one end of a metal bar causes heating at the other through conduction.

Convective heat is such heat as is delivered from some distant heating element, and is effective through radiation of an energy already developed. There are many types of machines for this purpose and they are commonly termed baking machines or bakers. This is one of the oldest forms of therapy that the human race has knowledge of. The effect of an open fire, the action of the sunlight or the effect of hot air, blown from any point of developemnt, are other and older illustrations of this form of therapeutic heat.

Conversive heat is that form of heat which is developed from some unheated source, and is the result of the conversion of energy or force into heat. Massage was the earliest manner in which conversive heat was made use of therapeutically, where the energy from motion was converted into heat.

Modern application of the electric current has produced an apparatus through which a current of high potential, with rapid alternations of direction of flow, can be directed between two electrodes which are placed on either side of a portion of the body. The passage of this current produces an intracellular friction or massage, which in turn produces heat. The volume of the current and its intensity govern the development of heat. It is at once apparent that the therapeutic effect of this type of heat is not necessarily on the surface of the body. The superficial congestion which is often noted after the usual form of heat treatments does not always follow a treatment by diathermy or conversive heat. The sensation of warmth may be experienced by the patient, and after the continuation of the treatmeent for 20 to 30 minutes, this sensation is often general. There is a local increase in skin excretion, so that electrodes which may have been applied dry, are found to have collected moisture under them.

Before describing and illustrating the different fallacies of various physical treatments, it is necessary to mention massage and the use of the galvanic current as therapeutic agents. These latter are mentioned only because they, as well as hydrotherapy, though really our oldest forms of physical treatments, are most often given in institutions equipped for such work or by some one devoting his entire time to such treatments, and the ratio of errors committed, through poorly given or wrongly given treatments, is therefore greatly reduced.

Thus far, consideration has been given only to such failures as result from a lack of knowledge of the therapeutic agent. Just a few words now as to failures which result from the wrong application of the agents, based on a misinterpretation of their indications.

Sources of Error

One of the chief reasons for mistakes in physical therapy and the application of the different treatments is because of the new-

ness of these forms of treatment. Massage and galvanism are old in years, and the knowledge of their uses had had sufficient opportunity for demonstration. Those interested understand the limitations of their usefulness and in most instances they advise them as adjuncts to other forms of treatment and, in some instances, advise *against* their use, because of certain known contraindications. Thus, no one would actively massage a recently fractured leg, nor ask that an acutely infected joint be given passive motion. The light stroking massage may be indicated and found soothing. Similarly, one would not use the galvanic current to produce heat in any portion of the body, for there are better means of doing so, if heat is all that is required.

Let us now take specifically the two newer additions to treatment by non-medicinal means. These two forms of treatment, light and heat, are artificially produced by the electric current. The energy we call electricity is only recently being further developed and better understood, so much of our knowledge in this direction has kept pace with our better understanding of electricity.

It is, at present, impossible to produce solar light artificially from any one form of generator, so we must content ourselves with the generation of the different sets of rays, with some spectral bands or segments either missing or accentuated. With each group generated we have a concentration of a predominant action, as in radium, roentgen rays, ultraviolet and so on into the infrared group. The individual properties of the different groups of rays are definitely determined; and therein enters a difficulty. Few of those in general practice who make use of these forces know their powers and limitations. Radium and x-ray therapy is now largely confined to the hands of specialists, but not so with treatment by other rays, which are becoming more popular with the general practitioner. I am not criticising such a policy, for I believe that physical therapy measures should be understood by all who practice the healing art; but I am of the opinion that it is fallacy for the general practitioner, without much knowledge or training, to dictate the physical treatment to be given, much less to give it himself. He all-too-often turns his cases over for physical treatments before he has given them the proper consideration from a general medical standpoint. He is prone to forget that physical measures are only an adjunct to our regular forms of treatment, and should be used in conjunction with them. Neglect in recognizing this fact is, in itself, one of the chief causes of the failures in the use of physical measures.

Most cases come to the physical therapist either too early or too late. When they have been improperly diagnosed and incompletely treated, or when they come with the recommendation, "Let us see what physical therapy will do", they come too early, and often many unnecessary treatments are given, before the etiologic factor is discovered and the proper medical or surgical treatment, or even the proper physical measures, are directed against the condition. Rarely is it possible, after such an error, to have the patient continue for the necessary course of physical treatments. No doubt the later treatments might prove rapidly efficacious in the relief of symptoms and the acceleration of the cure of the patient.

Cases come too late when, after going through the routine of various examinations and subsequent treatment, they become the victims of some chronic changes—neuroses, deformities or joint changes—the relief of which takes longer and is more costly than is considered practicable. Treatments by physical measures are costly; they are time consuming; and the patient who has neither time nor money usually is skeptical about undertaking such measures as a last resource. This is true, not alone of light therapy, but of all other forms of physical treatments.

There are other fallacies which must be considered, which are of the nature of errors on the part of those who administer the treatments, and by the watching profession and laity are considered as shortcomings in these types of treatment. The reason for these errors can, no doubt, be found in the newness of these types of therapy and the lack of proper specialization in this field. This is being corrected in regard to radium and x-ray therapy, because these treatments are more often administered by a trained specialist.

When a patient applies for the treatment of any ailment, and later finds that he has been benefited in the direction for which he sought relief, but is the victim of some other condition, the direct result of physical treatments, he is more prone to condemn the treatments, because of his secondary condition, than to praise them for the actual benefits he derived.

I wish to cite a case in my own practice, where the patient had been bedridden for a year. Following three months of treatment by diathermy, in conjunction with general treatment, she was able to leave her bed, and now, 18 months later, is quite well. However, she still comments adversely about the treatments, because of a superficial burn she sustained during a treatment given by the nurse in charge. Although she gives this treatment credit for her relief, she always takes occasion to comment on the severity of the cure. The burn made the lasting impression as well as left a visible scar.

Mistakes in Using Diathermy

The novice makes many costly mistakes in the application of heat. These errors, not only bring poor results and discouragement, but they arouse unjust criticism of a mode of treatment that is often effective beyond what is otherwise possible. The improper application of the electrodes in diathermy will defeat the purpose of the treatment, just as the improper use and estimation of the current will. Thus, the electrodes, so placed that they permit a superficial skin current path rather than through and through the parts, will never heat a joint nor the deeper body tissues.

Too great a difference in size of the electrodes is dangerous, except when used for surgical purposes. The necessity of the patient maintaining a more or less constant, and in many instances rigid position, to retain the body electrodes in their proper position for a 20 or 30 minute treatment, is at once a difficult and often painful procedure, and in itself often defeats the best-given treatments.

Attention must be given to the application of the electrodes. They should be retained in a manner which allows some changes in position without their contact being disturbed. Burns, inadequate treatments and discouragements are the reward of those who fall into errors. A properly applied bandage should be used for the extremities, and a binder, capable of adjustment to the movement of the patient, in chest and abdominal treatments. Accidents can be avoided through the use of the proper binder, but few take the time to see that these details are properly attended to.

Mistakes With Light

One of the greatest fallacies in connection with light therapy is the confusion of the therapeutic effect of the different ray groups. A surgeon who installed an air-cooled quartz-mercury lamp thought it would relieve the pain in a contused elbow joint. He gave an initial *eight-minute* exposure, giving it four minutes from two directions. The pain in the joint disappeared long before the effects of the sunburn. Another skeptical patient and another doctor uncertain that ultraviolet is efficacious in pain, are the net results of this mistake. It is a mistake to use the ultraviolet rays for this character of pain when one has access to radiant light to produce the necessary heat.

Elevation of temperature following general ultraviolet radiations is another fact often lost sight of. There is a distinct train of symptoms which can be laid to an overdose of sunlight, either natural or from some artificial source. They are: lassitude, nausea, headache and fever, later followed by skin tenderness and subsequent desquamation. These symptoms often acquire severe proportions and in the tuberculous and chronic febrile cases may prove disastrous. In my opinion, an overdose of ultraviolet radiation, accidentally given to a tuberculous patient who had been previously doing nicely under treatment, was the cause of the sudden aggravation of symptoms and the patient's untimely death.

A third type of fallacy merits mention. It is the fallacy of believing that a miracle is worked through the giving of a single treatment by some physical means. The days of miracles are past, but the days of speed — rapid changes of conditions — are with us. We must, in all fairness to ourselves and to physical measures, consider these rapid cures as the result of some previous treatment, in a patient so taken up with the desire for a rapid cure that he did not allow the proper treatment the time to prove effective, turned to physical therapy and, behold, became cured! The physical therapist who loses sight of the fact that he is a physician, and does not use physical measures in conjunction with the usual forms of treatment, as an adjunct, is laying himself open to the making of many errors. He should therefore, in these cases, try to place credit where credit is due, and not confuse the psychic with the actual.

It is important to bear in mind that there are many opportunities for error. These are the result of our present-day urge for speed; the recentness of our knowledge of

physical measures; our confusion of the indications for, and the effects of, the various forces; our erroneous conception that, "if a small dose is good, a larger one should be better"; and our lack of attention to details in the administration of the treatments.

We all-too-often proceed in the giving of physical therapy on the theory that, if there is no benefit from the treatment, no harm will result. This is entirely fallacious and unscientific, and hardly any criticism would be too severe to make against such an idea. Details are essential. They are often the determining factor between failure and success.

While all physical measures are coming into use by the general practitioners, it will be some time before most of them will be trained sufficiently in their theory and application to properly prescribe their use. Therefore, for the present at least, these forms of treatment should be in the hands of the trained specialist, just as is the use of radium and the therapeutic use of x-rays.

The laity estimates the value of a form of therapy by the results produced, and each physician is watching his brother, so that it behooves those of us who do use physical measures in our practice to make certain that we are sure of ourselves, our apparatus and our results, before we endeavor to convince others of our successes.

Physical therapy is here to stay. While its place in the medical practice of today may still be somewhat uncertain, in the hands of the specialist it answers the call of the age—the call for speed in healing the sick. Its greatest danger arises from its use by the inexperienced, who are carried away with enthusiasm and forget that they must use these agencies along with regular therapeutic means, if they are to be most effective.

Maison Blanche Bldg.

Acute and Chronic Circulatory Stasis

Treatment by Physical Measures

By William Martin, M.D., *Atlantic City, N. J.*

WHEN we speak of circulatory stasis we have in mind a damming off of a part of the circulation, usually venous; but there may be a stoppage or interference with the arterial flow also, since it cannot force itself through the infiltrated area. Stasis in an organ differs, in pathogenesis and treatment, from that of a local nature arising from some form of trauma, therefore these two types have been selected for the present discussion.

As an example of the local type we will consider one of the most common forms of injury—a sprained ankle. A fall or some sudden twist of the ankle will quickly produce the usual signs of inflammation—exquisite pain, swelling and redness. In a severe case the surrounding tissues become discolored, as well as badly swollen, within an hour or two. If nothing is done promptly for relief we usually see the victim limping or laid by almost immediately, and total incapacity is a matter only of hours.

Sprained Ankle

In the average case, the common treatment by applications of hot and cold water is followed, after which the part is strapped. Later, some liniment or lotion is generally prescribed, and after several days to a couple of weeks, the patient is able to be about, with the straps still around the injured ankle. Much valuable time has been lost, the ankle remains weak and one can never feel assured that it will be as strong as normal.

In all severe cases the possibility of a fracture should be considered and excluded or confirmed by a roentgenologic examination. When the diagnosis is actually made, proper treatment of a sprained ankle by physical measures should make a different story from that outlined as the result of the old-time and usual form of treatment.

In all inflammations we have the same general pathologic changes, and a sprained ankle is no exception. As soon as the injury takes place, nature attempts to heal it by filling the tissues with a serous exudate, which is in proportion to the extent of the inflammation. If there is tearing of tendons or ligaments, as may happen in severe cases, there will be a large quantity of exudate and the stasis will be marked,

as shown by great swelling. In all cases, no matter what the degree of injury, we should have the same therapy in mind, but of course the results will vary according to the conditions.

When such a case comes to the physical therapist, he will at once apply to the ankle some form of heat—infrared, radiant light and heat, diathermy or such other form as he chooses. A good dose of heat should be applied, and followed at once by the static wave current. This latter must be given with careful consideration of the patient's tolerance, for it will be very painful. The effect of this current is mechanically to force out the serous exudate through the normal channels, which allows the inrush of fresh arterial blood. One can almost see the reduction of swelling while the treatment is going on. Certainly, after it has been given, the swelling will be materially less and the pain almost gone.

This treatment will consume an hour, at the minimum, and is more likely to take considerably longer for best results. If the case is a very fresh one—within an hour of the injury—another similar treatment during the next ten or twelve hours will be practically all that will be required. If seen later than this, it may take several treatments, since the exudate becomes rapidly thickened and dense, which means that it is more difficult to express it from the tissues. This can be readily understood when one considers the pathology.

In the very recent cases there will be no need for strapping, although this may be done if desired. In the later cases it will be required for support between the times of treatment. These straps must be removed for treatments, since there will be sparking and a most unpleasant sensation if treatment is given through them.

In some cases it may be necessary to follow this treatment by a few indirect static sparks over the inflamed area. These are always needed in the cases not seen early, as the sparks have a tendency to cause quick, short contractions of the tissues, thus aiding expression of the exudate.

Static Treatments

The treatment just outlined will be intelligible to many, but for those who are unfamiliar with physical therapeutic measures it may be best to give a short statement of what the static current and sparks mean.

Practically every physician knows the static machine; and for the production of the wave current, the glass disk type of apparatus is the best. The current from the static machine is unipolar and unidirectional and is entirely mechanical in its effects. We attach the patient to the positive pole for the wave current, having the negative pole grounded, as through a hot-water heating system. Since it is unipolar, the patient must be upon an insulated platform, the current circuit being made through the air.

When the patient is connected to the machine by a metal electrode and wire, the machine may be started, but the pole pieces should be together, and be gradually separated. As the spark jumps across the gap made by the separation, there will be synchronous contractions, alternating with relaxations, of the tissues under the electrode. This contraction and release make for expression of the exudate, and also cause pain where there is an inflammation. The amount of current, as shown by the width of the gap, will be regulated by the patient's tolerance.

Sparks of the indirect type are given by the use of the same polar arrangement, except that the patient is not directly attached to the apparatus by a wire. The pole pieces are wide apart, with the platform attached to the positive pole by a metal rod or crook. The sparking electrode is attached to a separate chain, grounded to another ground than that of the machine. This electrode is held by the physician, and as it is pointed closely to the part to be sparked, the spark jumps and causes a quick, sharp contraction. This is painful over an inflamed area, so the length of the spark must be regulated accordingly. This is done by two methods: one is to slow the machine and place one foot upon the platform, to draw off some of the current; the other is to bring the pole pieces nearer together, so that a spark can jump across, and then use the electrode as before.

If one desires to spark any particular point, a spark director may be used. The effect of these sparks is similar to that of the wave current, but sharper and more active, and should be used over areas that cannot well be reached by the electrodes of usual type; they also accentuate the effects of the wave current.

Stasis in the Liver

The second type of stasis is that which involves an organ, and the best illustration is that of the liver. This may be the result of some focal or general infective process, although these factors are more prone to cause the inflammatory type which will not be considered here.

As a general rule the form of stasis under consideration is the result of a long series of digestive insults. We know that during and for a considerable time after the digestive process is going on there is a physiologic congestion of the liver. This organ, being situated at the head of the portal system, naturally receives the various substances absorbed from the walls of the intestinal tract and acts as a protective filter, by arresting, excreting and destroying the various toxic substances that come to it. Some metallic and other poisons are held by the liver, as illustrated by its retention of arsenic and phosphorus.

This great organ will withstand many insults and continue to function with fair activity for years, but the time will eventually come when it will give way under the strain, and what has been a physiologic enlargement will become a pathologic condition of stasis. As this continues, the size of the liver will gradually increase, until its various functions are materially interfered with, and a vicious circle is created, by which the patient suffers the various symptoms so well known to all.

When we can feel assured that this enlargement is simply what has been described, and not an actual inflammatory enlargement with definite tissue changes, the remedy is a fairly simple one. First we must assure ourselves of the size of the liver by an accurate estimate, arrived at by a physical examination with the clothing removed and by a roentgenologic examination to confirm this diagnosis, before treatments are instituted. In the very obese and those who are the victims of marked colonic flatulence, the physical examination will not avail much and reliance must be placed upon the x-ray. It has been my practice for a number of years to have the roentgenologic examinations made by an independent operator, following my physical findings, and then compare the two. These comparisons are always made with accurate measurements, using the same landmarks for uniformity.

The treatment pursued in these cases is, of course, in addition to all other usual measures, such as corrected diet, exercise, rest, etc., and these factors are not the least important, but should always be carried out with care and discrimination.

For therapy, diathermy is the most important measure, although there are other agencies that have much value in the treatment of this form of enlargement. The static wave current, the galvanic form of sinusoidal or the Morse wave current may all be used to advantage but, in my judgment, diathermy "fills the bill" better than any other treatment, if only one is to be used. This measure is now so well understood that no explanation of its workings will be required, further than to emphasize the fact that such treatments should always be given or supervised by a skilled physician.

There are, however, a few points that may well be considered in this connection. In the first place we must use metal plate electrodes of sufficient size, and these should be so placed that there will be no edge effects. The contacts must be good, therefore the skin should be well moistened, and for this purpose plain water is all that will be needed. Soapsuds offers a certain amount of resistance, as does also the jelly lubricant that some use, thereby requiring more current than would otherwise be required to produce the desired effects. Plain water obviates this and when the current charge is applied we will know that it is exact. The current dosage, as a rule, in my work, is seldom above 1500 milliamperes and is given always for at least a half hour, while a longer treatment produces better results.

When this treatment is carried out faithfully, every day, we may expect to get results almost without fail. It is my practice to check up by having examinations made, at first at the end of each two weeks, to note progress. One will at times be surprised at the rapid lessening of the enlargements, together with amelioration of the symptoms. If one cares to add either the static wave current over the abdomen, or the Morse wave current, there may be added progress, and such therapy will be considered to be good. In some of my cases this practice has been pursued but many cases recover with diathermy alone.

117 S. Illinois Ave.

Success with Diathermy

By F. W. Schroeder, M.D., *Strasburg, Ill.*

Recently I visited a prominent and very successful physician friend of mine and found that his otherwise wonderfully equipped office contained, among other things, a diathermy machine of the best make with a full equipment of electrodes, etc. He knew that I had spent years of study on electro-physical treatment and he asked me point blank, "Doctor, is there anything to diathermy?" This was a surprise to me, from a man of his capacity as a student. Upon going into the subject with him I found that he had his nurse give the treatments. He got poor results and was disgusted with his diathermy equipment.

The mere purchase of a diathermy machine means absolutely nothing. It does not make one a technician, any more than the purchase of surgical instruments makes one a surgeon. If you do not intend to put in several years of hard study and painstaking application, do not buy such equipment. You are wasting your money and will make a fool of yourself before your patients.

Mental Equipment

If you suddenly made up your mind to become a successful surgeon you would have to equip yourself, mentally, with a thorough knowledge of anatomy, physiology, histology, embryology, endocrinology, surgical practice, surgical technic and much other specific knowledge, which we all know is essential to successful surgery.

Successful practice with diathermy follows just such exacting lines. In the first place you must know anatomy; and by that I mean, have a sufficieent knowledge of the subject to do general surgery. You must also know physiology, and the more you know of it the better. If you do not take histology into consideration you may have a surprise waiting for you, as I did.

So far, however, most physicians would be well enough qualified, but how many know what diathermy really is and how the machine is constructed? One should have a little knowledge of electricity and the electric current. That he may not be merely "setting" his machine, he should at least know the relation between voltage and amperage, and what each means. He should know how a transformer is made and what it does; how a condenser is made what it is for; also what a rheostat is and how it works. In short, if he can take a piece of paper and make a drawing of the mechanism of a diathermy machine so that an electrical engineer would know what is meant, he has sufficient electrical knowledge to manipulate the equipment intelligently for treatment. If he does not have at least a modicum of this knowledge he will come to grief frequently. He will also miss the confidence in his ability to get the best results out of his machine.

Know your machine, both as to its make-up and its potentialities. Without this knowledge it may prove to be a white elephant. I can, today, purchase hundreds of perfectly good diathermy equipments for half their value, because their owners lack the knowledge to use them intelligently. In a few more years they will be as cheap as "model T" Fords are today.

Giving a treatment is an exact science and can not be learned out of the catalog of the instrument manufacturer. There is no book on the market now, nor will there ever be, that will tell you all you should know about diathermy, but if you will invest in several and diligently study them; if you will subscribe to several journals on physical therapy and read them carefully; also, if you will use the gray matter under your scalp on every treatment you give and regard every treatment as a very important thing, you will be on the road to becoming at least partially as efficient as your machine is.

Adjustment of Electrodes

Using electrodes of exactly the proper size is highly important. No quality built into your machine will supply the lack of their correct size. The position of these electrodes, especially on the limbs and around the shoulders and neck, will spell success or failure.

I believe I have one of the most intelligent technicians that money can employ. She watches every factor entering into a treatment and reports in detail. Often during a treatment she calls me in and draws my attention to this or that and is ever on the alert. To illustrate: We were treating a patient's knee, and after ten minutes an

inspection revealed that the path of the heat was not traveling as anticipated. A slight shifting of one electrode, by only an inch, changed the treatment from an ineffective one to one for which the patient felt grateful and for which he cheerfully paid his fee. Diathermy can be defined as a means of producing heat within the body. Wherever heat is indicated, diathermy can be used, and in most instances will be more efficient than anything heretofore tried. Study the effect of heat in its physiologic aspect and when you try to apply it by means of diathermy, be positive that you get it where you want it. If properly applied, in cases where it is indicated, it is one of the most remarkable therapeutic measures one can imagine.

Types of Cases

To illustrate a few of the high lights of the efficacy of diathermy I will quote a few cases:

Mr. D. was brought to my office suffering with sciatica so severe that he looked pitiable. An hour later he left my office walking on his own two feet and complained only of numbness in the afflicted limb, all his pain being gone. I told him to report the next day for another treatment. He came back the next day radiantly happy, refusing further treatment as he was "feeling fine".

Mrs. B. was advised that she must submit to a drainage of her gallbladder and I instructed her to see another physician. This she did and reported to me that Dr. X., a very prominent surgeon, had given her the same advice. She delayed a while and finally decided that she would first try my "'electric machine". In three weeks she was feeling completely relieved of all symptoms and a later operation for a pelvic disturbance allowed us to examine the gallbladder which we found perfectly healthy.

Since then I have treated many of these cases successfully. Where stones are a factor, diathermy gives but little relief, and that only of a temporary nature. I could cite many cases where the relief appeared wonderful, even spectacular, to the patient. I am not a mere enthusiast about diathermy, I am a firm believer in its employment, as in many cases I have obtained splendid results in chronic conditions where no relief had followed from taking the advice of specialists—or using Sloan's liniment, and every form of medication between. In fact our chiropractor has left town.

All sorts of patients come to you, thinking that your electric treatment can do almost anything. Do not attempt the impossible. It is poor business. If medicine can do the work better, tell them so. If only an operation will be efficacious, do the surgery. The ignorant enthusiast and the careless physical therapists are the ones who are bringing these methods into disrepute with the public, and when these are finally eliminated, the men who have the courage and vision to make the necessary intelligent effort will be able to place electrotherapy on a pedestal beside internal medicine and surgery, where it rightfully belongs. Diathermy is in its infancy, and the man who is inclined to give it his wholehearted attention has an opportunity to contribute much towards the future of its employment.

Financial Considerations

Put a value on the equipment you buy and on the personal effort it takes to become efficient in the use of your diathermy machine or any other electrical equipment you may purchase. I have found some physicians who give a treatment for a dollar. Do not purchase any equipment if you have not the courage to ask a better price than a dollar a treatment, for at that price it will be a financial failure. The charge per treatment must be regulated by the locality, but here, where doctors are charging fees considerably below those in most other places I know, I am charging $2.50 per treatment with any electrical agency I own, and $5.00 for x-ray treatments. I have no trouble in getting it, although at first I had a number of bargain hunters to educate. After the first few dozen had seen results and began praising the method, I had the idea sold, and today when I prescribe diathermy the usual question, is, how many treatments does it take. When I give the probable number they merely multiply by 2½ and they have the number of dollars it will cost them. If the patient cannot afford to pay a decent price and you know he cannot, *do not cut the price of the treatments.* Do the work for nothing! You will have less grievances. Just as soon as you cut the price, others will know of it and then your troubles will begin, I write from sad experience.

I do not believe that every physician has the proper mental qualifications to become efficient in the use of diathermy. By this I do not mean that they have a smaller mental caliber; Their minds simply do not

run in a mechanical direction, though they may be internists or surgeons of exceptional merit. Some doctors are highly intelligent mechanics, while other very good physicians could not grease a wheelbarrow. I am convinced that diathermy and other electric treatments will eventually drift into the hands of a smaller number of men who will make a greater success of it than will the masses, just as surgery became a specialty and thus has been brought to the standard of perfection it enjoys today.

It is not my intention to discourage anyone from attempting the use of diathermy, but the present wild purchasing of such equipment, combined with its unscientific use, is bringing disrepute upon this form of treatment and it will take years of painstaking effort to reeducate the public to a kindly attitude towards one of the most helpful contributions to the treatment of disease that has ever been put into the hands of the physician.

Physical Therapy and the Traumatic Spine

By J. U. Giesy, M.D., *Salt Lake City, Utah*

IN CONSIDERING injuries of the bony structures of the spine, we are confronted by a condition of severe trauma, followed by definite tissue damage, and our problem must, from the very inception, be one which shall entail upon us the restoration, in so far as we may assure it, of structural continuity and a resumption of function, since this is the only end result with which our patient or ourselves will be content.

In these days of industrial, and especially of transportation accidents, in which motor casualties play so large a part, fractures of the vertebrae are by no means rare.

Let us look briefly at what occurs in such a condition. The bone is fractured. It may be merely fissured, fractured completely or crushed. Circulation in the affected structures is deranged at once. Yet it is upon circulation that we depend mainly for repair, since it is quite naturally through it that all reparative activity is performed. Nerve trauma will, at the same time, exist to an extent varying from a temporary spinal concussion to actual paralysis. Naturally this nerve trauma will still further interfere with the processes of repair.

With those cases of injury, so severe that tissue destruction or damage means permanent loss of function, we shall not deal. Let us rather assume that we have a simple fracture of one or more vertebrae, and that nerve damage has not gone beyond the concussive stage. In such a condition and under a proper regimen these cases should within a few days be undergoing the processes of repair. These processes will consist of an absorption of products of tissue damaged by the accident, the laying down of a cartilaginous matrix in the region of the bony lesion, and, later, a consolidation of this reparative matrix by a deposition of lime salts therein, with a resulting restoration of the structural continuity of the bone.

Delayed Healing

Actually, however, this does not always occur according to schedule. From failure of the circulation to be restored to a normal balance—actually, in the earlier stages, of hyper-normal balance — or from low-grade infection, local or derived from foci otherwise posited in the body, or from some metabolic lack in the patient's physical economy at the time of the injury and continuing thereafter, these damaged vertebrae do not undergo a *full* process of repair. Radiographs, taken weeks or months after the initial trauma, show evidences of a decided lack of density in their shadows. They appear cloudy or actually "moth eaten"—if one may use the term to indicate the peculiar spotted appearance which they exhibit—the spotting indicating variations of density.

Manifestly, in such instances, there has been, not only a reparative reaction set up in their substance, but there has later developed an actual osteitis, which has resulted in a withdrawal from, rather than a deposition of, true osseous tissue in these bones. I would denominate this condition

a "rarefying osteitis," since it results in an actual rarefying process, detectable with either an x-ray plate or, at times, even with the fluoroscopic screen.

Bone hardness depends, to our present knowledge, upon the salts of calcium. Let these be absorbed from the bony structures, and a picture such as described above results. Consequently, an actual lack of stamina in the affected vertebrae follows, with a symptom complex consisting of pain on motion or, at times, more or less constant; feeling of instability on the part of the patient; limited activity, because of both former symptoms; and, consequently, a condition of partial or nearly complete incapacity.

When brought to our attention, these cases will give a history of injury by trauma, a partial recovery through a period of months, to a terminal condition such as described above, which has existed ever since. Part of this picture will be psychic and part of it physical, quite as a matter of course.

But the problem is, how to bring about a redeposition in the part affected of those salts upon which the normal rigidity and weight-bearing function of those structures depends, since a vertebra of this type, interposed in a spine otherwise normal, can only result in a large loss of the spinal column's normal leverage in all such customary movements as bending, stooping, sitting or rising or lifting the body from a prone position, in all of which activities these patients are actually very deficient or frequently require help.

In physical therapy we have a possible answer to our problem and one which, in a number of cases within the past year, has given me good results.

Normally bone regeneration depends upon the calcium and phosphorus salts and their use by the bodily economy in the process of repair; normally also, as we know today, parathyroid function largely governs the calcium and phosphorus metabolism; and normally the parathyroid contains a definite basic amount of manganese, apparently depending upon that substance for its functional integrity, just as the thyroid utilizes iodine. Furthermore, since we are sure of a deranged blood supply at the beginning, and our radiographs show us an osteitis still existing, we may feel well assured that a deranged circulation still persists.

Diathermy and Remineralization

These facts, taken together, should suggest a treatment technic. High-frequency currents, especially when used over bone, which by its greater density offers an increased resistance in the path of the current, thereby necessitating an arcing of the current about the bony obstruction, have a well recognized faculty of generating heat within the tissues. We take advantage of this fact in these cases, since the arcing of the current about the bone sets up a zone of heat which is exactly what we wish, because heat means circulatory stimulation through hyperemia due to the heat-induced dilation of the afferent vessels, and this hyperemia, other things being equal, means an increased nutrition of undernourished bone cells.

With our electrodes so cut and adjusted that they accurately concentrate the force of the current over the affected vertebrae, we give from twenty- to forty-minute seances of medical diathermy, using a milliamperage of from 700 to 1,000, according to the patient's tolerance. A large abdominal diffusing electrode is used and one of smaller size over the spine, cut so as to cover the zone of treatment, generally several inches long but not over three inches wide. This results in a determination of blood to the part and, since the blood stream contains a certain amount of lime, phosphorus and manganese, from the parathyroid, we will expect some effects.

But we should not forget the old story of the Israelites who were required to make bricks without straw. Having increased the blood supply, we should use it to transport the mineral salts to the supply zone requiring them. Therefore we should administer to these patients, either calcium and parathyroid or calcium and manganese dioxide daily. We should give them 15 grains (1 Gm.) of the latter and 45 grains (3 Gm.) of calcium lactate or 10 grains (0.65 Gm.) of calcium phosphate in each twenty-four hours. And we should give a commensurate dosage of parathyroid if we do not use the manganese. Thus we utilize our widened bloodstream to float our materials of repair to the required point, much as a river might be employed to float building supplies to a ready market.

Having delivered our bricks and mortar, we rely upon the workman which, in this case, is Nature, to employ them toward the desired result. And since experimentation

has clearly shown that the ultraviolet band of phototherapeutic activity has a definite effect on the calcium ion, tending to bind it in the tissues, as proved in the treatment of delayed union in other types of fractures by means of diathermy and ultraviolet radiation, these cases will also be found to benefit from general bodily radiations from a standard, air-cooled lamp, employed with the same technic as that used for effecting general metabolic stimulation.

Hence, the technic suggested in the type of cases under discussion, is: Medical diathermy over the zone of the lesion; calcium and parathyroid, or manganese dioxide medication, internally; and general bodily ultraviolet radiation. It is simple but it works, as the two following case reports appear to indicate.

Case Reports

Case 1.—Mr. H., well-nourished male, past middle age, was struck by an automobile some eighteen months before being brought to the the office for treatment and sustained a fracture of the eleventh dorsal and second and third lumbar vertebrae, as shown by x-ray at the time of the accident.

Recovery was good, save for a weak, painful back and inability to stoop or exert more than the most carefully controlled movement without increased pain. He had been a concrete worker before injury but had not worked since the accident.

X-ray showed an osteitis of the injured vertebrae, although union had occurred along the line of fracture. Otherwise the patient's condition was good.

He was treated by the technic described for three weeks, when he voluntarily discontinued treatment and went back to his former line of work. He has been working steadily ever since and alleges that he feels perfectly normal and has no pain.

Case 2.—Mr. S., a man of 76 years, was foreman in a mine and was caught under several tons of ore in a mine cave-in, sustaining a fracture of both pelvic rami from the ischii, of the right tuberosity of the ischium and of the fourth and fifth lumbar vertebrae. When first seen, x-ray showed good union of all fractures, but the lumbar vertebrae were cloudy and he complained of pain in the lower spine and was unable to stoop and straighten or to rise from a prone or sitting position without help.

Treatment as outlined, over a period of six weeks, resulted in complete freedom of spinal movements, without pain. The patient, when seen recently, declared that he is still pain-free and capable of normal spinal function, more than two months after ceasing treatment.

This technic is offered for what it is worth, but with the feeling that in such unfortunate cases it is worth enough to justify its trial, at least.

Some Effects of Music on the Human Organism

By Edward Podolsky, *Brooklyn, N. Y.*

THE effects of musical stimuli on the various organ systems has for some time gained the attention of psychologists and medical workers who have noted, under carefully controlled conditions, the effects of various musical compositions on human subjects. When a musical piece is enjoyed by an auditor he is immeasurably benefited at the same time, and this benefit is exerted as powerfully on his system as that produced by any chemical or physical agency that has been designed for such a definite purpose. But in the instance of music the effects are always attended with pleasure, which is not always the case with the other agencies.

Influence on the Respiration

Binet and Courtier, investigating the influence of music on the respiration, accomplished their experiments with the pneumograph. The reactions of a single subject were studied. In one series of experiments, isolated tones, chords, and musical exercises, possessing no intellectual or emotional associations, were used. These sensorial stimuli produced no respiratory modification, except an acceleration of from 0.5 to 3.5 additional respirations per minute. The acceleration varied directly with the increase of the movements, and was greater for the minor mode and for discordant sounds.

Musical selections, chiefly songs, arousing emotional associations, according to the introspection of the subjects, varied in their influence, according to the memories the tune evoked. Sad melodies accelerated respiration by 2.6, on the average; considerably diminished the amplitude; and pro-

duced irregularities in both acceleration and amplitude of respiration. Gay music; i.e., military marches, produced an acceleration of 3.8 and showed less tendency to reduce amplitude. A third class of melodies evoked complex and unclassifiable emotions, and including fragments of "*La Rencontre*", "*Laisse moi contempler ton visage*", "*Walkurenritt*', etc., produced an acceleration of 3.3 per minute, with a tendency to reduced amplitude.

The following table is a summary of the results:

MUSIC	RESPIRATIONS BEFORE	AFTER
Marche Triomphale ..... Tannhauser	9.6	13.5
Marche de Fauste..... Gounod	9.0	12.5
Marche Hongroise..... Berlioz	11.0	14.5
L'Epee Chant..... Wagner	9.5	14.0
La Chauvauchee ..... Wagner	9.0	14.0
Printemps (chant) ..... Wagner	9.5	13.0
La Rencontre..... Faust	10.5	13.0
Laisse moi contempler ton visage	11.0	12.0

Influence on the Muscular System

It was found that with the thumb-and-finger grip, the greatest pressure that could be exerted during silence was 4 Kg. When someone played the "Giant's Motive", from Rheingold, the grip was increased to 4.5 Kg. The "Slumber Motive", from the Walkurie, reduced the power to 3.24 Kg. Music also tends to reduce or delay fatigue and consequently increase muscular endurance.

Influence on the Nervous System

In 1887, Lombard observed the reinforcement of the knee reflex caused by music, while making a general experimental investigation of the variation of the knee-jerk in relation to the activity of the central nervous system. The apparatus consisted of a hammer, suspended on its axis through the handle, and falling like a pendulum, so that the force of the blow could be regulated; and a rod connected with the foot, sliding in the groove of a wheel, and equipped with a needle which recorded the extent of movement on a blackened surface. His observations may be summarized as follows:

CONDITIONS	KNEE-JERKS	AVERAGE
Silence	25 Experiments	32 mm.
Music of a passing band.	60, 71, 74, 60, 65.	65 mm.
"Maryland, my Maryland."	62, 76, 74, 71, 66, 64, 59.	64.7 mm.
Drum Corps	48, 55, 51, 55, 53, 49, 52.	51.8 mm

The amplitude of the knee-jerk, therefore, seemed to vary distinctly with the intensity of the auditory stimulus. There was an increase and a decline in the extent of the knee-jerks as the music approached and receded. In a subsequent experiment to test the effect of music on the knee-jerk, an air was played on a piano in an adjoining room. The average knee-jerk at 7 P. M. was 32 mm.; at 11 P. M., 29 mm.; so that at 10:30, at the time of the experiment the "normal" knee-jerk probably would have been about 30 mm.

STIMULUS	KNEE-JERKS	AVERAGE
Beethoven's Funeral March	82, 104, 96, 104, 99, 108, 95, 106, 118, 117, 90, 113, 119, 98, 100, 124, 108, 112.	105 mm.
Interval of quiet	83, 90, 90, 90, 56, 82, 59, 75, 50.	74 mm.
Soft Music	52, 63, 47, 50, 55.	53.4 mm.
Deeper passage	66, 73, 58, 78, 70, 86, 77, 87.	74.3 mm.
Soft	66, 43, 59, 62, 71, 68, 51.	60.4 mm.
More thrilling	79, 86, 86.	83.6 mm.
Varied and softer	58, 57, 79, 64, 47.	61.6 mm.
Quiet, 15 minutes later	25 experiments	29.0 mm.

These definite, clean-cut experiments seem to demonstrate fairly conclusively that music produces measurable effects upon the body's functions.

The clinical application of these findings should prove interesting.

511 Jerome Street.

THE SEMINAR

[NOTE: Our readers are cordially invited to submit fully worked up problems to the *Seminar* and to take part in the discussion of any or all problems submitted.

Discussions should reach this office *not later* than the 1st of the month following the appearance of the problem.

Address all communications intended for this department to *The Seminar*, care CLINICAL MEDICINE AND SURGERY, North Chicago, Ill.]

PROBLEM NO. 8 (MEDICAL)

PRESENTED BY DR. J. J. BUNN, MT. PLEASANT, NORTH CAROLINA

(SEE CLIN. MED. AND SURG., JULY, 1928, P. 523)

Recapitulation: Patient a woman of 68; high blood pressure (250 mm.) for years; arteries moderately sclerotic; several relatives died of apoplexy.

In the afternoon she heard of the death of her sister, from cerebral apoplexy, but seemed little disturbed.

In the evening she felt faint and nauseated and vomited once. When seen she was covered with a cold sweat; pulse weak and rapid; restless and with a sense of impending death; no paralysis of body or limbs; passed one involuntary stool.

She lived one hour and was conscious until the last, Shortly before death she complained of pain in the lower part of the back.

Requirements: (1) What was the cause of death? (2) Why? (3) What, if any, treatment might have saved her life?

DISCUSSION BY DR. F. D. DE STONE, MODESTO, CALIF.

She probably had acute dilatation of the stomach.

There was also a psychic effect: The knowledge that apoplexy was a part of her family heritage and that it might also fall to her lot, and the news of her sister's sudden death from that cause, instantly stopped digestion, and doubtless intense acidity followed, with dilatation of the abdominal vessels until anemia of the brain was produced.

Vertigo and vomiting would lend strength to this diagnosis. Pain in the lower part of the back, together with the involuntary voiding of stool, was probably due to the extreme acidity of the fecal matter passing into the already inflamed sigmoid flexure. A piece of litmus would have revealed this.

Urine with a sp. grav. of 1,010 showed additional paralysis of the eliminative functions. An undoubted low temperature would also tally with this diagnosis.

Requirement: (1) Acute dilatation of the stomach.

(2) Sudden shock causing anemia of the brain and fear of impending death.

(3) Large dose of epinephrin, hypodermically; stomach emptied by the tube or lobelia emetic; fill empty stomach with strong solution of magnesium sulphate; hot enema, two quarts, containing capsicum; put patient in a sitting posture with her feet in hot mustard water; hypodermic injection of Ringer's solution every 15 minutes; brucine, 1/64 grain, every 15 minutes, continued for at least ten doses.

DISCUSSION BY DR. E. I. RAYMOND, FORT COLLINS, COLO.

This sounds like a socalled suprarenal apoplexy. The picture is one of a sudden, severe, confined hemorrhage. Such a hemorrhage occurring in any other part of the body except the suprarenal medulla should show other symptoms, both subjective and objective. The similar attack of a year before would show that the gland was not normal. Her age would indicate some arteriosclerosis. A gland as rich in blood supply as the suprarenals would be most likely to suffer. The rapidity of the death would indicate hemorrhage rather than acute inflammation. The pain in the lower part of the back would help to differentiate from an acute hemorrhagic pancreatitis, which otherwise would be difficult.

As to the cause: It is entirely possible that the circulatory changes induced by the news of the death of a relative and occuring in the blood vessels of a gland

already somewhat diseased would be sufficient to cause such a hemorrhage.

I do not think that any treatment would have been of the slightest benefit in so severe an attack.

Tentative Solution by Dr. George B. Lake, Chicago

One of the most impressive features of this case is that it emphasizes the fact that an autopsy should be done upon the bodies of all who die suddenly or very rapidly, from doubtful causes. In this way alone can an honest and accurate death certificate be made out, in such cases, and even a postmortem examination will not always reveal the cause of death. In the absence of such study, and with the very meager clinical report furnished by Dr. Bunn, the solution of this problem can be, at best, only reasonably scientific guesswork.

It would seem that Dr. Raymond has made a sound estimate of the situation. Most cases of sudden or rapid death from "acute indigestion", "acute dilatation of the stomach" and the like are due to cardiovascular disease or to severe disturbances of the endocrine and autonomic nervous systems. It seems probable that, here, the gastrointestinal symptoms were merely incidental to the fatal condition.

A woman in late middle life, nervous, and with a history of prolonged hypertension and moderate arteriosclerosis, was a fit subject for a dramatic exit. The fact that a number of her relatives had died of apoplexy suggests familial syphilis.

The symptoms were definitely those of internal hemorrhage: faintness, nausea, clammy skin, weak and rapid pulse, restlessness, mental clarity and a sense of impending death. The brittle arteries, subjected for long to an increased pressure, made a background for such an occurrence.

The bleeding was almost certainly *not* intracranial, as there were no paralyses nor loss of consciousness. It was not, apparently, into the stomach, lungs or bladder, nor into the bowel, for had it been, the blood would have appeared through one of the body orifices. The fecal incontinence was probably agonal, such as frequently occurs at or near the moment of death from any cause.

There is no history of any physical injury, so the forcible rupture of a blood vessel by violence can be ruled out.

We are left with the hypothesis of *psychic trauma* as the cause of the hemorrhage. Some people are more stolid than others, when it comes to a display of emotion; but it seems that the death of an own sister, from a malady which the patient regarded as a family weakness, could scarcely have failed to produce a profound psychic shock, whether she manifested any emotional disturbance or not.

I agree with Dr. Raymond, that the bleeding probably occurred in the adrenal medulla, as this is a "silent area", so far as symptoms are concerned, and hemorrhage into the peritoneal cavity, pancreas or most of the other organs would have given some localizing signs of its presence. Moreover, the organs which would be most likely to suffer from an emotional shock would be the suprarenal capsules. Here, too, a hemorrhage sufficient to cause death might occur without a loss of blood great enough to produce the extreme pallor and air-hunger, which are the only cardinal symptoms of hemorrhage missing from this picture.

It seems improbable that any *wholly normal* individual should die as the result of a psychic shock; but persons whose organs were more or less seriously damaged might rather readily do so.

Dr. H. J. Achard, in a personal communication, recently reported the case of a young man who, after a hearty dinner, attended a prize-fight, where he became so excited that he fainted. He was taken home and revived with difficulty. About 2:00 A.M. he became very ill—his lips became swollen and cyanotic and he died promptly. No autopsy was held.

As a tentative explanation, Dr. Achard refers to Cannon's showing that strong emotions cause a profuse outpouring of adrenal secretion, followed by temporary depletion of the adrenal medulla, during which phase the organism is unprotected.

During the excitement of the fight the process of digestion probably stopped, and some incompletely-elaborated proteins may have been absorbed into the blood, causing anaphylactic shock and angioneurotic edema of such severity as to paralyze the cardiac nerve centers.

This case was related to Dr. Maximilian Kern, without comment, and he stated his belief that death resulted from angioneurotic edema, due to adrenal disturbance, thus backing up Achard's opinion.

Another interesting case is reported in *Journ. de Méd. de Lyon,* Nov. 20, 1926.

A middle-aged couple were approaching Lyon in their automobile, when they were stopped by bandits who threatened their lives. The man managed to start his motor and escape. His wife urged speed, as she felt ill. In Lyon, 15 minutes later, a physician found her dead.

An autopsy revealed no sign of physical injury. All the organs were infiltrated with fat; the aorta was atheromatous and the coronary arteries thick and hard. The cause of death was recorded as emotional shock due to fright.

It seems highly improbable, under the circumstances, that anything could have been done which would have saved this patient's life nor the life of the subject of this problem.

Problem No. 10 (Medical)

Presented by Dr. J. F. Roemer, Waukegan, Ill.

Young lady, 16 years old: Menstrual period in May did not materialize because, as she thought, she had taken cold during the previous period. Hot whiskey sling, sweat baths, hot foot baths, etc., failed to produce results. Physical examination was made by two competent physicians who pronounced her anatomically perfect. As a slight hacking cough developed, fear was held that she might be developing tuberculous tendencies, as there was some pain over the left chest.

The cough became worse, and she was sent to the writer for treatment.

Examination showed: pupils enlarged; coated tongue; very red lips; throat slightly congested; irritable cough; left lung sounds slightly rough. The patient was vivacious and talkative, on first visit, but on fourth visit would not talk at all, was slow in answering questions, showed a dull, stupid stare, and was apathetic. Her mother had come with her for the first time, and the following history was obtained with difficulty:

Patient was a very energetic, irritable person; a hearty eater; drank water *often* but only a little at a time; must go to the toilet frequently and must wait for urine to begin to flow, but would void only a small quantity with no pain on voiding, either before or after; must get up often at night, same procedure. Bowels moving regularly (rarely needed a cathartic) but had a feeling as if the bowels did not move satisfactorily. Patient continually talked of dying. Every slight pain or ache would elicit, "I know I am going to die". Stood well at school in all her studies. Led all her playmates in games, but knew she would die.

Up to the fourth visit, when her mother came with her, I was unable to get any of the above history.

A specimen of urine was asked for. She was obliged to go to the toilet four times in less than ten minutes, but voided less than 2 ounces in all four times. Urinary acidity, 150 degrees, by the acidimeter.

Requirement: (1) Further suggestions for diagnosis; (2) Treatment.

CLINICAL NOTES
AND
PRACTICAL SUGGESTIONS

What a Physical Therapy Technician Should Know

IT MAY be interesting to the profession to know what a technician who has had seven years of training and active service in physical therapy thinks that a good technician should know in order to conduct himself properly. I am here giving my ideas in tabular form.

1. Remember, you are only a technician and at all times must treat patients under a physician's orders. Do not at any time try to give advice to patients relative to their ailments. If any questionable condition arises, consult the physician under whom you are working, but *do not do it in the presence of a patient.*

2. Remember that your attitude towards the patients reflects back on the doctor; and if you do not help him by working in harmony and help him to build his practice, how can you expect to advance yourself?

3. Do not at any time discuss any one patient's ailments with another patient. This is a very poor practice. The patients are coming to your office with the confidence that their conditions are kept a secret by all concerned, and this must be respected if you want to keep their continued patronage.

4. Do not deviate from the treatment order just because a patient thinks it is wrong. Let the physician in charge decide that.

5. Should any question arise in your mind relative to any treatment order, consult the doctor, and after you are convinced as to the proper treatment, proceed as ordered.

6. In treating with diathermy, do not be in haste to get patients started and then wander off to some other work. Take your time. Make sure that all contacts are perfect and give only tolerance treatments.

7. Make sure that the appearance of your treatment rooms is neat and clean. See that a clean gown and linens are furnished each patient. Paper towels can be used if available; and before leaving the room see that the patient is comfortable.

8. Do not attempt to answer any technical questions the patients may put to you, as this is a subject for the doctor to answer. Adhering to this point will save both you and the doctor many an embarrassing moment.

9. Keep your equipment clean and in perfect working order. See that the insulation on your wires is not peeling, ruffled or cracked and that your electrodes are clean and perfectly smooth; also be sure you sterilize, in some manner, the body electrodes before using them on the next patient.

10. As before stated, remember that you are merely a technician and not a physician, and as such you have no authority to diagnose or treat any patient without his first having consulted a licensed physician, whose orders are given to you.

11. In all cases where patients are treated, especially with any form of lamps or heat, be sure you give them an alcohol rubbing and finish with a little talcum powder. This not only has its curative merits, but it has a psychologic effect, and patients leave your office feeling comfortable and do not hesitate to come back for further treatment.

12. Adapt yourself to meet all kinds of conditions and persons, ever remembering that sick people, especially chronic cases, become very irritable and cranky, and are hard to handle, giving you saucy answers or remarks. Learn to take these with a smile, even though you would like to express your opinion; after all, your work is to help sick people get well, and when they are well they too will smile.

Conclusions

We are all aware of the fact that physical therapy is still in its infancy and that hard work and strenuous efforts on the part of good technicians and earnest and sincere physicians will sooner or later educate the public as to its merits and will keep it out of the hands of the quacks, thereby placing it in its proper position in the field of medical art.

Although you treat the patients by applying the different agencies, under the doctor's direction, do not feel that this is the limit of your work. In order to become a proficient technician it is necessary for you to have the proper training and know how to use the agencies on hand properly.

Read all of the best works and literature that you can get hold of on this subject. Take all of the points you have received, extract from them the qualities which appear to you as being good, form your own technics and use only such as prove to bring results. Discuss these points, or any new mode of application that you may think beneficial, with the doctor under whom you are working and under no circumstances use them on patients unless the physician in charge consents, ever remembering that he is responsible to the patient for your conduct while treating.

Harry J. Stumpf, Technician.
Chicago, Ill.

Barbituric Hypnotics and Cocaine Poisoning*

Cocaine poisoning is especially common when using "cocaine mud" or flakes, or solutions of a strength greater than 20 percent. The patient may receive a dangerous dose, or there may be an idiosyncrasy. It is best to *color* the solutions, so that those of cocaine and procaine can be easily distingusihed from each other.

Cocaine is a cerebral stimulant, and chloral is an unsatisfactory antidote. Give 20 cc. of a 5 percent solution of *sodium barbital*, intramuscularly, when convulsions begin. If they are under way, give it intravenously, and save the patient.

The barbituric hypnotics, given before the employment of cocaine or any of its derivatives, seem to abolish idiosyncrasy, in those who show it. The prophylactic dose of Luminal (phenobarbital) is 3 grains (200 mgm.) and of barbital, 10 grains (650 mgm.), by mouth. Sodium-Luminal and sodium barbital are more soluble, and should *always* be used for injections, in the same dosage.

In over 400 operations, where no prophylactic was used before local anesthesia, 19 percent of the patients showed some toxic symptoms. Sixteen (16) of these patients were promptly relieved by Luminal.

In over 300 cases, operated upon under local anesthesia, in which 3 grains of Luminal were given, ½ hour before the anesthetic was injected, no symptoms of intoxication were observed. No morphine was given before the anesthetic.

M. R. Guttman, M.D.
Chicago, Ill.

*Abstract (by G. B. L.) of a paper read before the Illinois State Medical Society, May 9, 1928.

Physical Therapy and the Problem of Medical Cults and Isms

It is seldom that any group of medical men congregate that the various cults and isms do not come in for a general roasting and blanket charges are made of the fraud that they are perpetrating on the public. Then the general wail follows that something ought to be done about it. Other than this, about as much is done towards correcting the trouble as is done towards regulating the weather. The Christian scientist, chiropractor, osteopath, Abramist, and what not, receive their share of lambasting and the activity of the buccal muscles ceases only when they are exhausted. We plunge at these cults and isms like a maddened bull at a red flag, but our only weapon is irresponsible talk.

What does an impartial analysis show? The famous saying that "one can fool all of the people some of the time or some of the people all the time, but not all the people all the time," ought to help us here. Apparently, the cults do this very thing. However, whenever there is smoke there is said to be some fire and is it not possible that all these various cults have a spark of virtue? I feel that there is undoubtedly some good to be derived, either directly or indirectly, from the treatments of some cults and isms. I also feel that there are many weak points in our own system; but it is equally sure that ours is more nearly perfect than any other system of healing, else I would don a cloak of different hue.

As soon as we of the regular profession

come to realize that the cults may have some virtues, it will occur to us that we might, at least, investigate them sufficiently to discover just what those virtues are. When this is done, standardization is the next step. By that is meant that all first-class medical colleges should teach those features that are worthwhile, with the idea of adopting them. The schools should, not only teach the worthwile features, but should also place particular stress upon those the student should avoid. In this way the public can be informed from a reliable source regarding the type of charlatan to be shunned.

Our present method is to turn out the embryo M.D. ignorant of the cults and isms in about the same way that many mothers rear their offspring. Any girl is better prepared to sidestep the advances of designing men if her mother has properly instructed her regarding, not only the good man, but also the bad. We were taught only the best in medicine, but were never given a single lecture as to how to deal with our short-cut and decidedly inferiorly prepared competitor who has only the pocket book of his victim in mind. When we are asked about such and such a cult, we usually state to the inquirer that it is a fake, and promptly dismiss it. The patient then takes the shortest road to the miracle producer to tell him that we are jealous and a bunch of knockers.

It is difficult to imagine with what rapidity the spinal gymnastic specialist would disappear from our midst if every physician in a given city were instructed in his mode of treatment and possessed a table to show the patient when he comes into his office. At present it is easy to imagine every physician approached on the subject throwing up both hands and wildly exclaiming that he would not think of placing such a fake treatment table in his office, and that it is beneath his dignity even to discuss such a fraud. Just so long as we insist on burying our heads, not unlike the ostrich, just so long will we continue to be faced with many unnecessary and even harmful brands of healing.

It is one of two things: Our work is absolutely essential or it is not. The cults are either an essential or they are not. Let us find out which is needed the most, If ours is, let's stop theirs. If there is something in theirs worthwhile, let's adopt it. Why not? Let's also learn that part that is worthless or harmful and so instruct the public. It will not mean a fight at all, only a skirmish.

What other solution have we? Physical therapy. We have all practiced physical therapy during all of our medical and non-medical lives. Our mothers used liniments and rubbing. Rubbing did the work. The hot-water bottle was applied religiously. It always helped. Before the advent of the hot-water bottle, the hot brick or hot iron was used. Who has not used many such for his toothache? It did not cure the tooth, but it did cure the ache. The forceps was the cure for the tooth. What is physical therapy? It is the adjunct which should be used in the practice of medicine and surgery. It is the "missing link" of the medical profession. It will be used, in a few years, by every physician who cares at all about the welfare of his patient. If he does not have the equipment he will send the patient to one who has, and they will work in conjunction with each other.

In putting a patient to bed we employ physical means of therapy of the greatest importance, for we change the mechanics of the circulation. In applying a surgical dressing or splint we use physical treatment. External applications of heat have long been employed in the form of poultices of various kinds. In this connection it is interesting and significant that the heat of a living body was formerly believed to be of an entirely different character from that which emanated from the non-living. A puppy was considered a more effective therapeutic agent than a hot-water bottle, and the heat from a young human body was sometimes prescribed for the treatment of elderly invalids.

Massage and both passive and active motion have been used more or less from time immemorial, as also has hydrotherapy. The morning cold plunge, which has been recommended for every ailment to which flesh is heir, is but a simple form of physical therapy. Electricity, in some form or other, has had its vogue, as have sun light and colored lights. There have been elaborations in the application of posture, movements, rubbing, heat, baths, electricity and light, but after all there is little that is new, and because they do not savor so much of the occult as does chemotherapy (drug treatment),

they have been neglected sadly by the profession, which has preferred to wield the prescription pen or the carving knife, to the neglect of means which are less mysterious and spectacular. As a consequence, practitioners with neither knowledge nor skill have been reaping a harvest by unscientific hit-or-miss application of physical means.

We have heard much more of physical therapy since the War, in connection with injuries; and, indeed, its importation in this connection was one of the good things which we gained from the War. For a quarter of a century physical means had been highly developed in Europe, on account of the monetary importance of returning an injured workman to his job at the earliest possible date. The shortening of convalescence reduced the workman's compensation accordingly. When the War came, the same machinery was readily prepared for application for the speedy return of the wounded man to his place in the ranks. There was nothing new about it, except to American eyes. Since the War, one hospital in this country which deals to a large extent with the wounded from the ranks of labor and which has established an elaborate physical therapy department, finds that, in its fracture cases, the saving in time of recovery, compared with their records under the older methods, is from ten to thirty percent, according to the nature of the injury, while the recovery is also more complete.

A return to the physical therapy as practiced by our mothers, from that of today, with our wonderful electric machines accurately and instantly controlled, would be like discarding the automobile and going back to the oxcart.

We know that fresh blood supply is necessary in all diseases. For example, any good high-frequency machine will deliver heat to any part of the body in any amount. The lungs in pneumonia, a broken bone, a tuberculous joint, a neuritis, a lumbago, and the like, may be reached as easily as iodine is painted on a skin abrasion. Satisfactory results may be obtained in many sinus conditions, provided there is not confined pus. If there is pus, that is where the surgeon comes in.

Arthritis cases may be handled in many different ways; e.g., diathermy, ultraviolet radiation, the sinusoidals or galvanics. We all know that sunshine is tonic—a reconstructor—and that it fixes the calcium content and places the iron we administer in its proper place—in the red blood cell. In short, it normalizes metabolism. Its use in tuberculosis is too well known to be dwelt upon here.

Exercise of a part can best be accomplished by means of a Polysine generator—a machine of low tension, with ten different types of current. This takes the place of the ancient method of rubbing, and takes it well. The galvanic currents are our weapon wherever chemical changes are required.

I expect but one thing from this paper, and that is criticism. If it receives it, the paper will have achieved its purpose. Constructive criticism along all lines has accomplished wonders. It will do the same in the solution of this somewhat difficult problem. Whenever there is criticism it shows that the critic is thinking. If he has a better plan let him bring it forward. It is sincerely hoped that the biggest men in the profession will do some thinking, for their thinking will be accompanied by action, and by action results will surely follow.

J. S. Rose, M.D.

Lexington, Ky.

Value and Limitations of Electrolysis

THE modern name for the electric agency formerly known as "galvanism" is *electrolysis*.

Indications for Positive Electrolysis:

To reduce local edema and superficial passive congestions, as in phlebitis, sprains, subinvolution, congestive dysmenorrhea, cellulitis and furunculosis. It is *styptic* for some forms of epistaxis, menorrhagia and metrorrhagia *not due to malignant disease*. It is useful in neuritis and neuralgias due to pressure from congestions.

Contraindications:

Positive electrolysis is *not* to be used where we desire softening and active hyperemia, as in spasms, atresias, spastic dysmenorrhea, angiospasm and the like. It is *dangerous* in pregnancy.

Indications for Negative Electrolysis:

To soften and relax accessible strictures—urethral, eustachian, lacrimal, rectal, esophageal and cervical; to soften scars from burns, infected wounds, and tympanic sclerosis; in angiospasm with beginning gangrene (Reynaud's disease), sluggish

ulcers, infantile uterus, amenorrhea and spastic dysmenorrhea.

Contraindications:

Do *not* use negative electrolysis where bleeding is threatened and undesirable; where softening and swelling of the tissues would be dangerous; or where passive congestion is present, resulting from pressure. Keloids are made worse, and abortion may result, in pregnant women. — *Notes and Abstracts* (J. & J.), Vol. XI, No. 5.

The Effect of Sunlight on the Psychology of the Child*

WHEN ultraviolet rays play upon the skin, the skin becomes fluorescent. This is due to changes taking place in a substance called haematoporphyrin, which is abundantly found in the skin and its appendages. We can imagine this phosphorescence being carried through every part of the body by the blood-stream, bearing health with it.

The second chemical change which can be easily shown takes place in cholesterol, a substance occurring in almost every animal cell, and therefore plentiful in the skin. If one takes a piece of cholesterol which has been isolated and collected, and exposes it to ultraviolet rays, it not only changes in appearance, but it has acquired certain valuable properties, one of which is that when administered to rickety animals, it will cure rickets, or when given to animals which are on such a diet as will produce rickets it will prevent that disease. In fact, the rays have created in the cholesterol a specific vitamine which is anti-rachitic.

Other chemical changes are, that there is an increase in the calcium and phosphorus content in the blood. This content is responsible in a great measure for the integrity of bone structure, and the growth and calcification of the skeleton. The phosphorus content may have a direct bearing upon the psychology, for it has been noted, too, that patients in certain mental states show a phosphorus deficiency.

The effects of ultraviolet radiation are in many respects similar to those observed when cod-liver oil is being regularly administered. In this connection, it is interesting to note that it has been found by experiment that artificial ultraviolet radiation was more effectual than sunlight together with cod-liver oil. It was found that cod-liver oil as well as sunlight were slow in their action compared with ultraviolet radiation, which yielded better results. If every child could have a properly prescribed course of artificial sunlight for at least a month during its first year of life, there would be prospects of seeing rickets as a disease disappear entirely.

Sunlight increases mental activity. Subjectively, anyone who is using his brain to any extent while undergoing a series of exposures to light is conscious that his mind is more acute and his brain power increased. Objectively, it has been proved by the following experience: Mental tests were applied to children in special schools, on the one hand in London, and on the other at Alton. It was found that the children at Alton were mentally nearly a year in advance of the London children. After critical and scientific inquiry, the conclusion arrived at was that the superiority of the Alton children was due to the sunlight treatment received in that hospital. While the increase in physical development would be likely to cause improved mental activity, it was considered that it would be unlikly that this was the full explanation of the mental superiority of the Alton children. The interesting theory was advanced by Sir Henry Gauvain that the ultraviolet radiation might improve the nutrition of the gray matter of the brain, even as it induced bone repair in the case of rickets.

A healthy body has an important, if not basic, influence in the determination of the child's behavior, its character and psychology in general. Hence, is it not a logical inference that we should approach the psychology of the child by rendering the body healthy, curing it of any disease present or increasing its resistance to any which might threaten it?

Wherever heliotherapy has been practiced—and this is where children are being treated by sunshine, artificial or natural—the effect on their mentality is marvellous. Their very nature seems to change. Fretfulness vanishes and a happy cheeriness replaces it. Irritability flies away and a bright good nature takes its place. Among the diseases in which I have observed this are, impetigo, chilblains, acne, eczema, psoriasis, and other skin diseases, surgical tuberculosis, and rickets, tuberculous glands and peritonitis, infantile paralysis, rheumatism, "growing pains", ear discharge, hay-fever,

*From "The Mind of the Growing Child", edited by Viscountess Erleigh, Oxford University Press, 1928.

and infantile syphilis. This list by no means exhausts the diseases benefited by ultra-violet radiation. That there are many other conditions, such as convalescence from illness and diseases, in which benefit could be obtained from sunlight, is obvious from what I have said. Not only in disease itself, but in conditions midway between health and disease, has sunlight proved to be of well-nigh miraculous power.

To the child who is never very ill, never very well, often ailing with no definite illness, but usually troublesome, capricious, and fretful; to the child for whom the doctor almost in despair recommends a "change of air, preferably the seaside", sunlight, natural or artificial, opens the gate of the high road to health.

While simple open-air treatment without heliotherapy will improve the general health and appearance of these patients, the contrast between both the physical and mental condition of these patients during the periods when heliotherapy can or cannot be practiced, is striking in the extreme. In a ward of twenty children all suffering from the same disease, ten on one side were given regular artificial sunlight treatment, and ten on the other side were not so treated. In other ways treatment, diet, etc., were precisely similar. While the physique of those receiving light treatment showed improvement, as compared with the others, the effect on mentality was even more marked. Those exposed to sunlight were much happier, more vivacious, more alert, and I may add more mischievous. They would often laugh and sing, and appeared to be overflowing with animal spirits, while their fellows remained silent. The contrast in appearance, spirits and mentality was most striking, and was remarked on not only by those concerned with their care, but also by casual visitors.

F. HOWARD HUMPHRIS, M.D.,
London, Eng.

Anesthesia for Surgical Diathermy*

THE most satisfactory anesthesia for performing surgical diathermy operations is obtained by giving, hypodermically, one tablet of H.M.C. No. 1 (hyoscine hydrobromide, 1/100 grain; morphine hydrobromide, ¼ grain; cactoid, 1/60 grain), 1½ hours before operation, and another ¾ hour before.

When the patient is on the table, give just enough ether to relax him satisfactorily, and then remove all the ether apparatus from the operating room, so as to avoid the danger of an explosion.

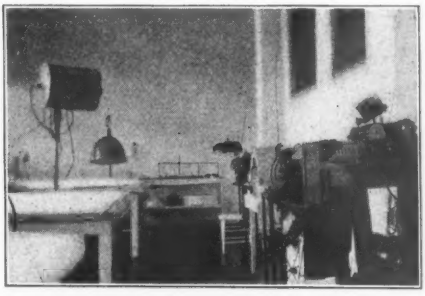
After "cooking" the tissues with the high-frequency current, do not remove the sloughs, but let them separate naturally.

(Two cases were exhibited, showing excellent results following the removal of squamous-cell carcinomas of the hard and soft palate, by means of surgical diathermy.)

W. E. HOWELL, M.D.

Chicago, Ill.

[*Note*: In the discussion, Dr. Max Thorek remarked that H.M.C. injections are dangerous when given by persons untrained in their use, such as many nurses.]



Physical Therapy Equipment

THE United States Veterans' Bureau Hospital, for nervous and mental diseases, at North Chicago, Ill., has an efficient and well organized physical therapy department.

The picture shows the arrangement of the room where actinotherapy and the various forms of electrotherapy are applied. Hydrotherapeutic treatments are given elsewhere, the equipment being very complete.

The arrangement of apparatus here shown seems to be very satisfactory and economical of space.

GEO. B. LAKE, M.D.

Chicago.

Diathermy in Pneumonia
(A Word of Caution)

I NOTICE that in your September number you are to devote particular attention to physical therapy. Here is a point which is of very great importance, but which I have never seen in print. It is

*Abstract (by G.B.L.) of a clinical talk before the Staff of the American Hospital, May 31, 1928.

not, however, original with me. I got the idea from Dr. C. M. Sampson, in one of his lectures.

In pneumonia, one of the chief indications is to support the circulation. If it fails the patient dies. One of the chief contraindications to the use of diathermy is never to use it over an abscess unless the latter has very good drainage, because it will cause tremendous absorption of the pus and render the patient toxic.

Now to combine these two ideas: *Never* use the electrodes from a diathermy machine directly over the affected lobe, because this will cause absorption of the toxic material. On the contrary, place the electrodes over some other part of the lung, or even on the arm or leg. The bloodvessels between the electrodes will dilate and more blood will pour through them, thus relieving the back pressure on the heart. The circulation of the whole body will be improved within a few minutes and the patient will experience relief.

J. T. MacKay, M.B.

Saskatoon, Sask., Can.

—

[This is a worth-while suggestion and should be given consideration. If all users of physical therapy will think out the physics, chemistry and physiology of the things they are trying to do with these relatively new and very powerful agencies, they will have no cause for regrets and these methods will not fall into disrepute, as they are in danger of doing if men who have made insufficient study of their powers and properties insist upon going ahead blindly and using them unintelligently, upon ill-selected cases.—Ed.]

Physical Therapy and the Tonsils

I HAVE been looking in vain for some one to reply to the article by Dr. Hamilton, in the March issue of Clin. Med. and Surg., p. 201, on focal infections from tonsils and teeth. As no one has done so I feel constrained to accept the task.

I am especially interested in defense of the tonsils, and my opinions are based upon the results of many years' experience. I removed my share of tonsils for many years. The past twelve to fourteen years I rarely do so. My therapeutic results are now so superior to what I believed was possible that I would rather sacrifice all other therapeutic measures, if necessary, than forego the benefits to be obtained through tonsillar therapy. For years I have been employing with great satisfaction both diathermy and ultraviolet radiation (both air- and water-cooled lamps), using the latest and best equipment in such lines.

The tonsils, with proper treatment, will quickly relieve congested mucous membranes of turbinated bodies and sinuses of the nasal passages, immediately aiding and permitting normal drainage of these parts, with relief of the existing congestion and inflammation. For this reason, as natural drainage of the tubes, ducts and ostii of the nasal passages is re-established, serious diseases of the antrum, middle ear and mastoid rarely develop. Through relief of the ethmoidal accessory sinus, many baffling eye conditions respond immediately.

Naturally, the benefits to be obtained by attention to so important a link in the human defense are noticed in treating general diseases of all kinds. Conversely, I believe the children and adults whose tonsils are removed, surely pay the penalty in lack of defense against infections later on.

The brilliant results that follow, in a certain percentage of cases of tonsillectomy, are usually temporary, due to relief, in large part, of congested mucous membranes, such as follows tonsil treatment. But not for long. Sooner or later, if chronic foci exist elsewhere, the troubles recur in a very much aggravated form. Following influenza or ordinary colds these patients easily develop sinus disease (often incurable), mastoiditis, bronchial diseases, appendicitis and, in later life, easily become prey to many organic diseases.

The prevalence of sinus disease today is mainly due to loss of the tonsils. If such attacks should develop in one who still has tonsils, the attacks can be overcome comparatively easily, because of the assistance which can be obtained by tonsil treatment.

The recent investigation by the United States Bureau of Health has proved to be quite a blow to the enthusiastic tonsil enucleators. This investigation only proved conclusively that there was less tonsillitis and diphtheria. These conditions would become rare if proper attention were given to the tonsils.

Remember, this investigation compared only cases enucleated with average cases

possessing tonsils which have not had the benefits of the attention outlined above. Should such an unbiased investigation be made, between cases enucleated and cases with *functioning* tonsils (and they can practically all be easily made so), a very embarrassing situation for the medical profession would, I am afraid, arise.

GEO. L. RENAUD, M.D.
Detroit, Mich.

Fairy Tales of Proctology
"The Rectum Is a Reservoir for Feces"

LONG before the days of this and that, the engineer constructing the then-new alimentary canal realized that when he had built thirty feet of gastro-intestine he had gone far enough with the idea. "This," said he, with an air of finality, "has got to end!" Anatomically, the result of this decision has been the rectum and anus.

Now, not everybody knew of this event, so as time went by, weird stories came to be told as to why the rectum existed. "Obviously," said the philosopher on physiology—"since feces come through that tube and must await expulsion, the lowest part of that tube must be a reservoir in which feces collect until the time when." This being a self-satisfying explanation and rectums, as a rule, not being endowed with vocal cords wherewith to plead their own defense, the fable grew.

However, strange as it may seem, the fact is that it did not occur to the philosopher in question, that one can no more reasonably consider a passageway like the rectum to be a reservoir for feces than to consider the vagina as a reservoir for the fetus, or the vestibule of a house as a place where people collect before leaving a building.

Of course, a fairy tale is no place for facts and it is for this reason that I hesitate to state that the normal, undisturbed rectum is an empty organ. I say a normal, undisturbed rectum because a r e c t u m which has been deluged from above by liquid feces and belabored from below with soap-suds can hardly be considered a normal rectum.

For many years, and even now, this fairy tale has pleased the unthinking minds of countless medicos. Not only did the fable grow, but it prospered lustily upon the gruel of tradition. Now, tradition is a heavy rust to have settle upon any thinking process, because all t h a t happens (even when it refutes the fable) is considered to prove the rule or to be the exception which clenches the evidence. Part of the tradition which has helped the rust to settle even more thickly upon the wheels of thought regarding the function of the rectum is that which was known in the olden days as proper preparation of the rectum.

"A cathartic the day before and an enema the morning of," chanted the soothsayer on proper preparation of a case for rectal examination. This being done by the minions in the temple, the patient was duly elevated to the central point of importance as the subject under consideration. The medico then inserted the speculum, withdrew the obturator and promptly struck oil. "I told you so," chorused the learned ones, and from thencforth on, all the spectators, and particularly the prospector who had struck the oil, were firmly convinced that the rectum was eternally full of corruption.

Thus, it seems, the rectum has long been placed in a false light, or as they say at the club, "It got a dirty deal," for normally the rectum is the cleanest of cavities, but we surely cannot consider any organ normal which has been irritated from above by cathartics and excited from below by a soap-suds enema.

But still textbooks say the rectum is a reservoir for feces. That is their story and they are going to stick to it, and if that be true science, make the most of it.

J. F. MONTAGUE, M.D.
30 E. 40th St., N. Y.

THE LEISURE HOUR

Your Country Brother*

Your country brother!—did you ever think
That he might be almost as good as you?
And did you ever, when you took a drink,
Wish he were with you, and could have one, too?

Didst ever think, while riding in your car,
All snug and warm, along your lighted way,
Of this poor brother going twice as far,
On horseback, and for only half the pay?

And did you ever, in your office warm,
With feet on desk and chair reared back at ease,
Think of this brother in the winter's storm,
Along a lonesome road, where you would freeze?

Didst ever wonder, sitting in your club,
With "two-bit" smoke acircling 'round your head,
If Dr. Mossback, that old country dub,
Were still in practice, or had joined the dead?

Ah! Some of you have come here to forget
That once you trod this country brother's road;
And some poor miserable cuss is yet
Struggling to live, where you laid down the load.

And some of you have never shared his lot,
And know not of the trials that he endures;
Yet, think not, from your elevated spot,
That this lone fighter doesn't deal in cures.

He may not know, with learnéd phrase profound,
The incantations of a Widal test,
But he will cure his patient, safe and sound,
And leave the monkey-business for the rest.

He doesn't count corpuscles in the blood,
Nor wait to get that index called "opsonic",
But nips his little ailment in the bud,
And doesn't let the pesky thing get chronic.

His head and heart are filled with things like these:
Horse-sense, good cheer, and sympathetic touch;
He lends his patient joy, and gives him ease,
And doesn't trouble Wassermann o'ermuch.

---

*A Toast, given at the Annual Banquet of the Peoria City Medical Society, in 1912.

His clothes may not be of the latest cut;
His feet may not be patent-leather clad;
But he has tact and talent, without "strut",
And in his head are things you never had.

He fills his little niche as well as you;
Is found on duty, early morn and late.
You'll find that many love him dearly, too,
And Peter's waiting for him, at the gate.

So, you who once did tread this brother's road,
Soar not so high you can not see his face;
And you who never carried such a load,
Don't think him member of another race.

Reach out your hand and grasp his, good and true;
Remember you are making no mistake;
You're teaching *him*, the while he's teaching *you*,
And you're *both* bettered by the mix you make.

OSCAR ALLEN, M.D.

The Perils of Disguise

Young Lady: "Druggist, can you fix up a dose of castor oil so that it will not taste?"

Druggist: "Certainly. If you will wait a few minutes, I will fix you up. Will you have a drink of soda while you are waiting?"

Young Lady: "Thank you, yes."

Druggist disappears behind the partition to reappear a few minutes later. "Is that all you require?"

Young Lady: "Yes, thank you. Is it ready?"

Druggist: "You've just drank it."

Young Lady: "Goodness gracious, that was for mother!"—*The Red Fez.*

A Reasonable Choice

Misogynist (to woman): "All this feminism is sheer nonsense. There isn't a woman alive who wouldn't rather be beautiful than intelligent."

"That," said the woman, "is because so many men are stupid and so few blind."—*Tid-Bits.*

Not Collegiate

"Anyhow, there's one advantage in having a wooden leg," said the veteran.

"What's that?" asked his friend.

"You can hold your socks up with thumbtacks."—*Columbus Jester.*

Get Rid of It

Husband (at breakfast): "I've got a bad head this morning."

Wife: "I'm sorry, dear. I do hope you'll be able to shake it off."—*Boston Transcript.*

"Did you strike this man in an excess of irascibility?"

"No, sah; I done hit him in the stummick."—*Baltimore American.*

A Logical Inference

"What is your name?" asked the new teacher of the first boy in line.

"Tom," said the boy.

"No, it isn't Tom, it's Thomas."

"And your name?" she inquired of the next boy.

"Jackass," said the boy. — *Waterbury Chamber of Commerce.*

Enthusiasm for Anatomy

She had a vast amount of money, but it had come to her quite recently. One day an acquaintance asked her if she was fond of art.

"Fond of art!" she exclaimed. "Well, I should say I was! If I am ever in a city where there's an artery I never fail to visit it."—*Farm and Fireside.*

Thumbnail Therapeutics

Ultraviolet as a Galactogogue

Daily exposure to ultraviolet rays, beginning with 5 minutes at 80 cm. distance, and gradually increasing to 25 to 35 minutes at 60 cm., caused an increase in the milk of 20 nursing mothers, with no bad results. After the increase was established (which required one to two weeks) the intervals between treatments were gradually lengthened to twice a week.

The breasts should be entirely emptied before each treatment.—Drs. Stolte and Weiner, in *Deut. Med. Wchnsch.*, Feb. 17, 1928.

The Constant Current in Neurology

Based on the experience gained from over 23,000 electric treatments, given from 1922 to 1926 at the New York Post-Graduate Medical School and Hospital, I think that, on the whole, the constant current is the most practical and useful kind of electricity in neurologic work.—Dr. John J. MacPhee, New York, in *Internat. J. Surg.*, March, 1928.

Physical Therapy

If we utilize radiant energy in the form of visible light, infrared or ultraviolet, we are actually using the primal source of all terrestrial energy.—Dr. B. L. K. Poyntz, Portland, Oregon, in *Med. Herald and Physiotherapist*, June, 1928.

Electrothermy in Diseases of the Rectum and Anus

Electrothermic methods are efficacious in the treatment of pruritus ani, fissures, fistulas, external and internal hemorrhoids, and rectal polyps. The healing following destruction of diseased tissues with high-frequency electric currents is usually prompt and with little or no pain. These operations are almost bloodless and are most frequently performed under local anesthesia.

Malignant polyps and other forms of carcinoma are best treated by a combination of radon and x-ray with electrothermic methods. Healing is more rapid and less painful than when using heavy radiation alone, and the patient has the double security of two physical therapeutic agents.—Drs. Howard A. Kelly and Grant E. Ward, Baltimore, in *Internat. J. Surg.*, March, 1928.

Irradiated Cod Liver Oil

From experiments on rats it appears that irradiation for 30 minutes with ultraviolet rays from a quartz-mercury lamp does not enhance the antirachitic potency of cod liver oil potent in vitamines and that irradiation for 2 hours noticeably decreases the antirachitic activity.—Dr. E. T. Wyman and Associates, in *Am. J. Dis. Child.*, Nov., 1927.

High Frequency Current in Urology

The high frequency machine is the most compact, the least uncertain and the most inviting equipment available for the urologist. — Dr. Victor C. Pedersen, New York, in *J. Urol.*, May, 1928.

Skin Affections of the Ear

Radiant heat-light, for the acute type, and ultraviolet energy for the chronic forms of skin diseases — eczemas, furunculoses, dermatites—of the ear have given promising results and have replaced unsatisfactory and unreliable medicinal remedies.

For alteration of systemic errors, general body irradiations, with quartz lamps, supplementary to local treatment, are quite often of marked value. — Dr. L. Savitt, Chicago, in *Arch. Phys. Therap., X-Ray, Radium*, April, 1928.

Zinc Ionization in Otitis Media

Zinc ionization has proved useful in cases of chronic purulent otitis media with profuse suppuration and a large perforation in the drumhead. Although the first result is to increase the discharge, subsequent appli-

cations result in a diminution, and sometimes all discharge ceases under treatment. —Dr. H. L. Brooks, in *Arch. Phys. Therap., X-Ray, Radium,* April, 1928.

Removing Hairs with X-Rays

Do *not* remove hairs with x-rays. There is danger of causing burns and the hairs usually grow again.—Dr. M. J. Hubeny, in *Urol & Cutan. Rev.*

Ultraviolet Rays and Metabolism

Rays from a quartz-mercury lamp are capable of causing an appreciable reduction in the total metabolism, in certain persons.—Drs. E. H. and H. H. Mason, in *Arch. Int. Med.*, Mar., 1927.

Economic Value of Physical Therapy

So remarkable is the economic saving ascribable to physical therapy that the Aetna Life Insurance Company cheerfully expends thousands of dollars to support such a clinic entirely free for their incapacitated policy holders.

The electric scalpel or "cutting current", though surgical in application, is a physical therapy evolution; and conservative surgeons, like Kelly of Baltimore, and Clark of Philadelphia, are employing it to the exclusion of the knife where such a bloodless eradicator and non-disseminator of infection may be preeminently preferable. —Dr. Jos. E. G. Waddington, Detroit, in *J. Mich. St. M. S.*, May, 1928.

Removing Plaster Casts

1.—Make a slight cut in the cast with an ordinary cast knife, as a marker.

2.—Drop a 25 percent solution of sodium or potassium citrate along the scratch, from a dropping bottle.

3.—Complete the cut in the softened cast with any available knife.

This method is quick, easy, cheap and harmless.—Drs. D. H. Shelling and M. D. Cohen, in *J.A.M.A.*, July 21, 1928.

Physical Therapy in Constipation

A sufficient amount of water is always required by constipated patients—hot water, especially on rising, for the spastic patient; cold for the atonic. Various hydrotherapeutic measures, such as hot baths and hot applications, preferably in the form of abdominal packs, aid in relieving spasm. For emaciated and visceroptotic patients a well fitted abdominal pad is helpful. In all cases a moderate amount of exercise, particularly of the abdominal muscles, is required.

In addition to active exercise, abdominal massage and electricity are indicated. In the spastic type light massage and the galvanic current are helpful, while in atonic cases vigorous massage and an interrupted sinusoidal current may be employed. Deep breathing exercises are always beneficial.—Dr. Russell S. Boles, of Philadelphia, in *J.A.M.A.*, Nov. 19, 1927.

Radium Treatment of Cataract

The observation of a series of personal cases justifies the conclusion that the application of radium, properly screened, does not injure the eye; that frequent treatments are necessary, especially at first; that opacities of the lens disappear under the influence of radium; that radium has a selective action on the lens; and that the use of radium in no way interferes with subsequent operation, if necessary.—Dr. H. L. Brooks, in *Arch. Phys. Therap., X-Ray, Radium,* April, 1928.

Diathermy for Scleroderma

A case of definitely determined scleroderma in a young girl was apparently not affected by uroformin or endocrine therapy. Five treatments with diathermy gave encouraging results; disappearance of local asphyxia, secretory troubles, pain and functional impotence. — Dr Babonneix and associates, in *Bull. Soc. de Pediat. de Par.*, Jan.-Feb., 1927.

Leg Ulcers

In a stubborn leg ulcer it is well to try the effect of zinc ionization before condemning it as "chronic."—*Urol & Cutan. Rev.*, Oct., 1927.

Cold Air a Tonic

Rollier attributes to the cool Alpine air to which his patients are exposed while taking "the cure" a large part of the benefit received.

Residents of temperate climates, where warm summers alternate with cold winters, are much more resistant to disease, more energetic and progressive than are the

dwellers in warm climates. Those who leave the wintry North for warmer southern climes, are likely to experience a notable letting down in vital stamina and resistance to disease. Southern Florida and the Bahamas are comfortable homes for hopeless cases. — DR. JOHN H. KELLOGG, in *Good Health*, Nov., 1927.

Specific Effects of Ultraviolet Rays

The energy of effective ultraviolet rays from specific portions of the spectrum has specific functions. The wave lengths which cause erythema and tanning are not the radiations which protect against rickets when a rickets-producing diet is used. Further, unless the rays are present in sufficient concentration to surmount a threshold value, no biologic effects will be produced. —DR. HERMAN GOODMAN, of New York City.

Cool Air in Tuberculosis

In the general treatment of tuberculosis, exposure to cool air, promoting tone and metabolism, is as important as exposure to light. — DR. LEONARD HILL, in *Brit. J. Tuberc.*, Oct., 1927.

Diathermy and Gastric Acidity

Diathermy treatment of the stomach at frequent intervals, over long periods of time, with a current of low milliamperage and medium voltage, tends to increase the gastric acidity, both free and total.—DR. L. J. BRODY, in *Arch. Phys. Ther., X-Ray, Radium*, March, 1927.

Ultraviolet in Erysipelas

The application of 1.5 erythema doses of ultraviolet rays is useful in erysipelas. The irradiated area should extend 4 cm. beyond the affected part in all directions.—DR. J. BECKER, in *Münch. med. Wchnschr.*, March 25, 1927.

Corrective Exercises and Massage in Infantile Paralysis

In the paralyses following anterior poliomyelitis, exercise and massage are not sufficiently understood and used.

We must begin, as soon as the fever subsides, with local and general massage. The nerves should be stretched.

Exercises should be slow and voluntary, the patient cooperating in all passive exercises, and should be continued as long as any improvement is seen. — DR. A. F. MÖLLER, in *Med. Klin.*, No. 24, 1927.

Physical Measures in Psychiatry

The continuous immersion tub bath, at a temperature of 96°F., is unequaled for quieting patients with delusions and hallucinations. Motor restlessness is better managed with the cold pack or the continuous hot bath.

The electric light cabinet bath, with hot and cold showers and massage, is valuable in treating the psychoneuroses.—DR. T. H. WEISENBERG, in J.A.M.A., Oct. 8, 1927.

Galvanism in Thyrotoxicosis

Galvanism, applied to the thyroid gland or the cervical sympathetics, has proved helpful in a number of cases of thyrotoxicosis.

In the former case, the anode electrode is placed over the thyroid and the larger cathode at the nape of the neck. A current of 3 to 8 milliamperes is employed for 10 to 15 minutes. In the latter case the cathode, 9 sq. cm. area, is applied close under the angle of the jaw and the anode, 240 sq. cm. at the nape. A current of 2 to 5 ma. is employed for 10 minutes.—DR. R. LOEBEL, in *Zeitschr. f.d.g. phys. Therapie*, Aug. 1927.

Clinical Diathermy

I have clinically demonstrated to my satisfaction that no portable instrument will satisfactorily deliver conversive heat; and conversive heat is all that we want in diathermy.—DR. H. D. HOLMAN, Mason City, Ia., in *Arch. Phys. Therap. X-Ray, Radium*, Feb., 1928.

Roentgen Sickness

Roentgen sickness resembles sea-sickness in many particulars. The underlying factor seems to be a deficiency of sodium chloride in the body. The exciting cause is irritation of the autonomic — particularly the parasympathetic—nervous system.

In this condition, as in sea-sickness, we must combat vagus irritation. The loss of sodium chloride must also be made good. For the former purpose, *lobelin* is the best drug, given intravenously, 1½ hours after

the exposure. The proprietary product, "Roentgenosan", consists largely of sodium chloride. — Dr. G. Von Pannewitz, in *Münch. med. Wchnschr.*, Sept. 22, 1927.

Diathermy in Common Colds

An article by Dr. Hamm in *Klin. Wchnschr.* for Oct. 8, 1927, reports that diathermy treatments relieve the symptoms of acute coryza very promptly and without untoward results.

A nasal electrode is enveloped with rubber plaster and applied high up in the nose, against the lower turbinate. The indifferent electrode is held in the hand.

The current is increased until it becomes disagreeable, and is then reduced slightly. The average current tolerated is about 50 milliamperes. The treatment is given for 10 minutes in each side of the nose.

Hydrotherapy in Hypertension

High blood pressure may be reduced by a tepid tub bath of 20 to 30 minutes duration (or an electric light cabinet bath for 8 to 10 minutes), followed by a cold shower for 15 to 30 seconds. The duration of the cold application should gradually be increased.—Dr. C. E. Stewart, in *Archiv. Phys. Therap.*, Aug., 1927.

Neuropsychiatry and Physical Therapy

For the sedation of excessive stimuli, as in mania, or of erratic stimuli, as in chorea, the prolonged neutral tub bath comes first, then ultraviolet rays, and finally autocondensation, the last-named being definitely sedative in some cases of arteriosclerosis and toxemia. Some neurasthenics obtain a quieting effect from the static breeze. In tremor, the Morton wave from the static machine is often beneficial.—Dr. Arthur H. Ring, Arlington Heights, Mass, in *Internat. J. Surg.*, March, 1928.

Ultraviolet and Bone Repair

Ultraviolet rays are of value, not only to promote the growth of bones, but to facilitate their repair when fractured.

Tisdall and Harris showed that there is an increase of the phosphorus and calcium in the blood during the repair of bones.

If the bone of an animal be fractured, and the sympathetic nervous system be inhibited by full doses of atropine, repair will not occur, even though ultraviolet irradiations are used. If, on the other hand, epinephrin be given, to stimulate the sympathetic system, repair will be unusually prompt.—Dr. A. D. Willmoth, in *Med. Herald and Physiotherapist*, Dec., 1927.

Antirachitic Power of Irradiated Ergosterol

Pure ergosterol, after ultraviolet irradiation, becomes the most powerful antirachitic substance known. Five milligrams of irradiated ergosterol is equivalent in antirachitic potency to one liter of good cod-liver oil.—Dr. Thomas Stephenson, Edinburgh, in *Prescriber*, Oct. 1927.

Galvanism in Asthma

Galvanism, applied to the pneumogastric nerve, often gives great relief in asthma.

The positive pole should be attached to a pad 2 inches in diameter, placed at the side of the neck, just below the tip of the mastoid process; the negative pole, with a similar electrode, should be applied just below the tip of the ensiform cartilage.

Treatment for 5 minutes, with 10 to 15 milliamperes of current, will give relief, but the current should flow for 15 minutes. Five or six treatments, given daily or every other day, will usually control the attack.—Dr. A. D. Willmoth, Louisville, Ky., in *Med. Herald & Physiotherapist*, Dec. 1927.

Static Electricity as a Systemic Tonic

In pulmonary tuberculosis, static electricity restores energy and strength to the weak and exhausted; it aids the hopeless to eat; it stimulates the failing heart; it quiets the nerves, aiding sleep and rest; relieves pleuritic pains and helps in the cure of the condition so there will be no return.

Without its powerful aid I could not have restored to the pay roll 92 percent of all cases of tuberculosis.—Dr. I. D. Gibson, Denver, in *Med. Herald*, Sept., 1927.

Vibration in Nasal Infections

Vibration, for 3 to 5 minutes, with a ball vibratode applied over the interspaces between the 7th cervical and 1st dorsal vertebrae, effectively controls the acute symptoms of coryza, rhinitis, nasopharyn-

gitis, and is useful in acute exacerbations of chronic sinusitis, with purulent discharge. —Dr. George J. Ott, in *Phys. Therap.*, April, 1928.

Ultraviolet Therapy in Bronchitis

The study of 37 children with bronchitis, treated by ultraviolet radiation, has proved the method to be of distinct value. The average number of exposures per capita was about 7, usually twice weekly with an interval of one or two days.

Non-tuberculous bronchitis yields far better results to ultraviolet radiation than does bronchitis due to Koch's bacillus. This therapy is also of value in cases of enlarged thymus.—Dr. H. H. Perlman, Philadelphia, in *Arch. Phys. Therap. X-Ray, Radium*, March, 1928.

Cancer of the Mouth

The region of the mouth is abundantly supplied with both lymphatics and blood vessels; glandular structures are more abundant than in any other section of the body. These structures will not stand the same amount of irradiation that other organs of the body will tolerate and when tissue is over-radiated it is converted into a precancerous state.—Dr. H. Hartwell Bass, in *Internat. J. Med. & Surg.*, August, 1927.

Irradiated Dry Milk

The ultraviolet irradiation of ordinary milk has been found to give it antirachitic qualities. It is not, however, practicable to irradiate the milk used by babies in the home but it has been found that dry milk (or desiccated milk) can be irradiated and endowed with the same antirachitic powers present in ordinary milk. Irradiation does not interfere with the nutritive or keeping qualities of the milk powder, nor does it give it any disagreeable odor.—Drs. G. C. Supplee and O. D. Dow, in *Am. J. Dis. Child.*, Sept., 1927.

Diathermy in Ophthalmology

Diathermy is a valuable adjuvant in the treatment of blepharitis, conjunctivitis (especially gonorrheal), corneal ulceration, inflammatory conditions of the sclera, retrobulbar and orbital tumors and after enucleation, before adjusting the artificial eye.—Dr. Merimanoff, in *Rev. gen. d'ophthalmol.*, No. 3, 1927.

Radiotherapy

The term, radiotherapy, as generally used, applies to the employment of x-rays and radium in diagnosis and treatment. Those who would use these rays, safely and satisfactorily, must be well grounded in all branches of fundamental medical knowledge.

The new *beta rays* from the Coolidge tube are still an unknown quantity, and may prove to be powerful for good or evil. —Dr. A. Sailand, in *J.A.M.A.*, July 16, 1927.

Neuritis

Negative galvanism is indicated in chronic neuritis, if the current can penetrate to the affected sheath, and should be followed by sinusoidal current and the Morton static condenser discharge.

In acute neuritis, use diathermy—not too long or strong; radiant heat and light for one-half to one hour, at least 15 inches distance; mild erythema doses of ultraviolet rays from a carbon arc or quartz-mercury lamp; and the pencil effluve from a static machine for 20 to 30 minutes.—Dr. J. G. E. Waddington, in *Archiv. Phys. Therap., X-Ray, Radium*, Dec., 1927.

Ultraviolet Rays for Nursing Mothers

Of 53 lactating women exposed to carefully regulated ultraviolet irradiations, all experienced general benefit and in 36 the milk supply was improved and retained for long periods.—Drs. R. C. Chisholm and M. McKillop, in *Lancet*, July 30, 1927.

Current Medical Literature

Present Status of Physical Therapy

In an article in *J. Indiana S.M.A.*, for November, 1927, Dr. Edwin N. Kime, of Indianapolis, sums up the present status of physical therapy.

Granger, in *J.A.M.A.*, Oct. 8, 1927, listed the abuses of physical therapy as follows:

1.—Faulty diagnosis, inaccurate observation and over-enthusiasm.

2.—Lack of teamwork and the utilization of other specialties.

3.—General paucity of knowledge of the subject.

4.—Low standards, intellectual and ethical, widely prevailing.

5.—Electrosurgery by physical therapists who are not surgeons, or by surgeons without the physical therapeutic training or assistance.

6.—The failure to employ physical therapeutics when indicated.

7.—The reference of only incurables and undesirable patients to physical therapy. Results in such cases are not a true criterion of its real value.

Kime, who has studied the question thoroughly and is qualified to express an opinion, restrains his enthusiasm and sums up his conclusions very conservatively.

1.—Physical therapy, although of real value when used as an adjunct to medicine and surgery, is not a panacea, is not even a specific for any proven disease, and has been greatly overexploited and abused, both by medical and pseudo-medical practitioners.

2.—The abuses of physical therapy are due not so much to the inefficiency of the apparatus as it is to inadequate or inappropriate use.

3.—Correction of this state of physical therapeutic chaos requires the determination of basic principles, standardization of apparatus and technic, and critical analysis of results.

4.—This can best be accomplished by following the recommendations of the Council on Physical Therapy of the American Medical Association, and allied organizations of regular medical men, which have been officially recognized by the American Medical Association.

Therapeutic Exercise

Dr. J. C. Elsom, of Madison, Wis., in *Physical Therap.*, Nov., 1927, states that to prescribe exercise intelligently, we must appreciate the different effects of the kinds of exercise and the immediate results on the different muscle groups.

All exercise should be well within the capacity of the performer; violent and straining exercises are never advisable.

Development of the *fundamental* muscles is essential, especially in childhood. The use of the *accessory* muscles requires much nervous control and they produce but slight effect on the important functions of the body; their training should not be overstressed in early childhood.

The parts of the body must be given that form of exercise for which they are best adapted.

There should be no effort to develop every individual into a common mould. We must recognize types and prescribe our exercise accordingly.

Those exercises which are pleasurable are always most beneficial because of the intimate connection between mental and physical processes.

There was daily regularity in the muscular work of our ancestors, particularly primitive man, but now "we are all in a state of chronic toxemia from lack of exercise".

Acute inflammatory disorders, structural cardiac disease, duodenal or gastric ulcers and tuberculous infections generally are contraindications of exercise.

Nearly all forms of abdominal ptosis are correctable by exercises of the groups of the abdominal muscles. "Girth control" is an important consideration.

There never was an age in which there was less demand for muscular work to earn a living, than today.

Heat and Light Treatment of Leg Ulcers

A method of treatment, which has given uniformly good results during the past ten years and which brings about the cure of leg ulcers and other trophic disturbances of the legs in about 6 weeks, is described by Dr. Glenn W. Putnam in *Arch. Phys. Therap. X-Ray, Radium*, March, 1928.

For the poor local circulation, radiant heat is used for about 3 weeks until local swelling has subsided and the color is good. A 1000-watt lamp, at 12 inches distance, is employed for 15 minutes. The distance may be greater with very poor circulation, gradually reducing it.

Paint the ulcer with 2-percent Mercurochrome solution after each application and apply a small pad of sterile gauze ¼-inch thick and slightly larger than the ulcer area; over this place a 2½-inch cloth elastic bandage, from the toes to 2 inches above the varicose veins, if any, or to just above the calf of leg.

After about three days, instead of the Mercurochrome, apply a limited amount of 5-percent scarlet red over the crusted ulcer and over this a few layers of gauze, oiled silk or paraffin and the elastic bandage. The crusts will soon come

off in a macerated form, but the ulcer will show a heavier discharge and not look so good. However, it is progressing. Wipe away the discharge, apply the lamp and return to the Mercurochrome painting and repeat within the next few days, if necessary. Soon you will see a healthy granulating ulcer base and closing-in process. Treat for 6 days after the discharge disappears and then apply the final scarlet red dressing which will bring away the crust.

If, as very exceptionally occurs, the response is not good, take a scrub brush and biniodide soap and scrub the ulcer briskly; also an occasional painting with tincture of iodide will stimulate repair.

This method is intended for cases which are primarily due to poor circulation.

Ultraviolet Irradiation of the Blood

Drs. J. E. Gonce and K. Kassowitz, in J.A.M.A., Jan. 28, 1928, say that the killing power of blood in vitro for certain test bacteria, before and after general irradiation, affords a criterion for the changes in the antibacterial properties that have taken place in the body.

Continuous daily quartz lamp irradiation for more than four weeks, with routine exposure time and distance, was given to a large number of suitable hospital patients. The ultraviolet portion of the spectrum between wave lengths 2000 and 3100 A.U. was utilized. Exposures to the front and back of the entire body were given, starting at 35 inches for three minutes, and increasing, by 1 minute and 1 inch of approach daily, up to a maximum exposure of 20 minutes at 25 inches distance, kept up for a period of from 14 to 80 days.

Completely normal persons are apt to show improved bactericidal properties after continuous ultraviolet irradiation; those suffering from chronic infections and post-infectious conditions, after daily quartz lamp treatments, are apt to show a drop in the bactericidal property of the blood.

The general conclusions reached from the study were that the increased or reduced bactericidal property of the blood after ultraviolet irradiation seems to depend largely on the leukocyte reaction of the body.

Leukocytosis following ultraviolet irradiation varies in individuals or even in the same individual. In the majority of the authors' test cases the maximum leukocytosis appeared to have been reached about the seventh hour of irradiation.

Diathermy in Gonorrhea of the Male

In *Illinois M. J.*, Oct., 1927, Dr. R. E. Hunt, Belvidere, Ill., describes his technic for the diathermic treatment of gonorrhea in the male.

A specially manufactured electrode (GX-G11) is used. This consists of two parallel, inflexible strips of metal which are bent with downward concavity along their entire length of about 3½ inches, and used as electrodes. They are attached to two carrying-bars which clamp to a weighted and insulated standard allowing them to be raised and lowered at will.

Solid, surgical green soap is used for lubricating the electrodes. As a lubricant for the penis, the following formula is employed: 2 tumblerfuls solid green soap, 3½ oz. water, 3 oz. glycerine. The first two items are boiled at a steady heat for one hour, then the glycerine is added and the mixture boiled until of a creamy consistency.

With the patient in a sitting position, the lubricated penis is placed between the two electrodes which are adjusted to fit snugly.

Although the temperature (113°F.) necessary to kill the gonococci instantly cannot be reached, an approach to such a temperature will kill a great number of the germs and a number of treatments, each lasting about 4 minutes, will be necessary to complete the cure. From an initial current of 500 milliamperes, the strength is gradually raised to 1000 or 1450 M.A.

In connection with the diathermy, injections of mercurochrome, 1½ percent, about five times daily, are employed. Methylene blue and methenamin are administered by mouth.

The treatments are given every second day until the patient states that all of his discharge has stopped except the "morning drop". They are then continued every third day until this stops and for two weeks thereafter. Following this treatment, the author has found that posterior urethral soundings have been consistently negative.

Electrocoagulation

Electrocoagulation, with the d'Arsonval double-pole current, is an ideal agency in many conditions, including warts, moles, angiomas of the vascular type, epitheliomas, etc. The tissue loss is small, scarring is less than after cutting operations, there is less liability to infection and no stitches are needed.

The after-treatment is simple. Any of the milder antiseptics may be used. Some advise curetting after coagulation, but the coagulated mass is a good dressing and renders hemorrhage less likely. The average time a patient is under treatment is eight weeks. — Dr. S. J. Rose, Lexington, Ky., in *Med. World*, March, 1928.

Roentgenotherapy of Skin Diseases

In *Urol. and Cutan. Rev.*, Jan., 1928, Dr. O. R. Chandler, Pueblo, Colo, gives the results of his x-ray treatment of certain skin diseases.

For acne, the technic used in 20 cases was: 90 kilovolts, 5 milliamperes, 12-inch anode-skin distance and 2 minute exposure to each body area.

In the treatment of the face, the exposure was made first on one side and then on the other, with the forehead receiving the same exposure perpendicularly. Treatments were given once every 10 days. The results of treatment in all 20 cases was a perfectly normal, smooth skin surface, except in one case in which the patient discontinued the treatments. The great number of treatments in any case was 16 and the least 7.

For eczema, the same type of radiation was used as in acne. In all the 41 cases treated there has not been an increase in inflammation following any treatment, and in all there has been noted a gradual clearing of the skin.

Most of the cases were localized eczemas of duration ranging from two weeks to twenty years. The greatest number of treatments required in any case was 16 and the least number 2. Sixteen patients showed a clear skin on discharge, 2 were improved but not quite well. Some of these patients have been followed for 3 years without showing recurrence.

Eight of 12 cases of fungus disease treated by x-rays are apparently cured, and in cases involving the hairy regions there is a perfect return of the hair. These cases included some of mycelium infection.

Diathermy in Pneumonia

The use of diathermy in the treatment of pneumonia is advocated by Dr. N. J. Seybold, of Toledo, in *Ohio State M.J.*, March, 1928.

The prevention of the spread of pneumonia should be attended to by the usual methods, but for pain, high temperature, cyanosis and labored breathing, diathermy is indicated. It is the best physical measure for prevention of extension to other parts of the lung and to check consolidation and fibrin formation.

While Dr. Seybold does not believe that diathermy is a specific for pneumonia, yet it is a distinct aid in the treatment, and is not contraindicated under any circumstances.

In 66 cases of pneumonia, 45 of which were postoperative, 384 diathermic treatments were given. No untoward effects of the diathermy were observed in any case. In the 45 postoperative cases, the mortality was 13 percent and in the nonoperative cases it was 21 percent. The ordinary death rate of pneumonia is around 40 percent.

Dr. Seybold states that in the U. S. Marine Hospital, New York, pneumonia treated by medication plus diathermy showed a mortality much below the average.

Zinc Ionization for Otorrhea

Cases of chronic otorrhea, in which there is a large perforation below the handle of the malleus or in which the greater part of the membrana tensa is missing, are the most suitable for ionization treatment. This type forms a fairly large proportion of the whole and several reports in the literature attest that ionization gives excellent and rapid results.

Dr. G. A. D. McArthur, of Melbourne, Australia, in *Am. J. Phys. Therap.*, Sept., 1927, reports that he has used ionization during the past few years, when suitable cases presented. So far as his experience goes (short histories of 11 of these cases are cited), the method appears to be a useful addition to the armamentarium for the treatment of otorrhea, especially for patients who cannot give the needed amount of time for the ordinary treatment.

The technic consists in cleansing the ear and then syringing it with warm zinc solution (zinc sulphate, 4.5 Gm.; glycerin, 60cc.; water to 2 liters). The earpiece of a Seigle speculum is inserted into the meatus and some of the zinc sulphate poured in. The positive electrode, which consists of a piece of zinc wire inside a vulcanite speculum, is then placed in the ear and the negative electrode on the arm or leg. The current is turned on and gradually increased to 2 or 3 milliamperes and allowed to flow for ten minutes and then gradually decreased. Sudden changes of current should be avoided. Sterilization by zinc ions occurs only on tissues actually covered by the zinc solution.

Colon Irrigations for Diarrhea

Dr. D. H. Nesbit, Charlotte, N. C., in *Southern Med. and Surg.*, Feb., 1928, reports a very severe case of diarrhea (10 to 15 stools a day), which had continued for three months, cured by colon irrgations.

Careful examination excluded amebic dysentery and sprue.

Rest and restricted diet were prescribed and each day the man came to the office for colon irrigation. The diarrhea was checked in 4 days.

The method used was as follows: The patient lies down on the left side with the knees drawn up and a 6-inch, metal rectal tube is inserted in the lower bowel. Water from a 1- to 3-gallon container is allowed to flow in slowly until the colon is filled, when it can be expelled through a waste tube without removing the rectal tube. This procedure can be repeated as many times as necessary and in this way the colon is completely cleansed and all irritating material removed.

Ultraviolet Rays and Vaccine Virus

Dr. T. M. Rivers and associates, of the Rockefeller Institute for Medical Research, in *J. Exper. Med.*, Jan., 1928, state that the skin of a rabbit, treated for a few minutes with ultraviolet rays and then inoculated at once with vaccine virus, is less susceptible to the action of the virus than is untreated skin. If 24 to 72 hours elapse between the time of irradiation and inoculation, the treated skin appears to be more susceptible than is untreated skin. Skin repeatedly exposed to ultraviolet irradiation is less susceptible to the action of vaccine virus than is non-irradiated skin.

In other experiments, these investigators found that the amount of radiant energy required to kill staphylococci, at single wave-lengths in the active ultraviolet region, was approximatey the same as that necessary to inactivate vaccine virus.

The Electrorhythmic Current in Obesity

In *Phys. Therapeutics*, for Jan., 1927, Dr. Franz Nagelschmidt, of Berlin, Germany, reports the development of a new type of current which he calls the electrorhythmic. It is said to possess all the advantages of the Leduc sinusoidal current, and in addition is *alternating*. It also avoids the disagreeable features of the Bergonié faradic muscle exerciser.

This current can be completely controlled as to tension, intensity, number of periods and duration of current flow, and, without the interruptor, will produce electric sleep or narcosis. When used with rhythmic interruptions it is

serviceable for electrodiagnosis and the treatment of paralyzed muscles; applied to the entire body it is helpful, for exercise, in convalescence, heart disease, etc., and for disturbed metabolism, especially in obesity.

Since 1912, 300 obese patients have been treated by this method with good results. The reduction in weight depends upon the number of treatments. Those who had from 15 to 19 treatments lost an average of 5.3 percent of their weight; while those who received 35 or more treatments lost, on an average, 12.6 percent of what they weighed at the beginning.

Diathermy in Nasal Sinusitis

Dr. Chas. R. Brooks, Newark, N. J., in *Physic. Therap.*, April, 1928, says experience shows that the early use of diathermy can eradicate sinus disease before the involved structures are irreparably damaged. The use of diathermy in sinus infection has shown a degree of resulting recovery that frequently surpasses all expectation.

The application of direct diathermy is advised in uncomplicated sinus disease. The active electrode, in frontal sinus and antrum infection, is a strip of metal placed over the affected region or regions, of sufficient size to cover the forehead. The inactive dispersive electrode, of the same material but larger, is placed over the upper cervical spines. A current strength, to the tolerance of the patient, is allowed to pass for 20 to 30 minutes.

High-frequency intranasal treatment may follow the diathermy applications to the affected sinuses. The Oudin current is used, or the d'Arsonval current in some cases.

Diathermy, combined with other physical measures or applied singly, in sinus diseases has, to some extent, replaced older methods of treatment; and occasionally seemingly incurable conditions have yielded to such treatment.

The Place of Physical Measures in Therapeutics

In *Radiology*, March, 1928, Dr. Frank B. Granger, Boston, Mass., says that with the establishment of the Council on Physical Therapy of the A.M.A., physical therapy is being placed on a rational and scientific basis. It should be used only as an adjunct to standard medical and surgical procedures.

Ordinarily a physical therapeutic prescription should include two or more of its subdivisions.

In many surgical conditions, functional restoration is dependent on physical therapy. In many pathologic conditions the addition of physical measures of treatment secures results which either could not be attained without it, or which, if attained, would require much longer periods of time. Teamwork with other branches of medicine is essential.

Physical Aids for Partial Deafness

There has been much development of mechanical and physical aids for aural diseases.

In *Arch. Phys. Therap. X-Ray, Radium*, April, 1928, Drs. A. R. Hollender and M. H. Cottle, Chicago, report the clinical effects obtained after their experimental work on animals regarding the merits of diathermy, galvanism and ultraviolet rays in partial deafness.

Diathermy is administered by placing the active electrode behind the external ear, with the indifferent electrode anterior to the ear on the opposite side. Usually 250 to 300 milliamperes suffice. The time for a single treatment is about 20 minutes, after which negative galvanism is given for 5 minutes through the same electrodes. Three applications per week are usually enough. For otosclerosis, general body irradiations, with the air-cooled mercury vapor quartz lamp, should be tried in addition to the diathermy.

The accompanying table shows the results obtained by the authors:

Table (for Comparative Purposes) Showing Results Obtained in a Series of Cases of Partial Deafness

	Total No. of cases	Nasal or Pharyngeal Pathology	Nose or throat operations performed	No. of cases previously treated by other methods	Average No. of treatments	No. of cases in which Tinnitus was present	No. of cases Tinnitus relieved	No. of cases in which hearing improved
Catarrhal Otitis media (catarrhal deafness)	61	39	35	57	36 to 72	22	12	9* 12** 40***
Otosclerosis	29	6	2	25	54 or more	23	9	3* 1**
Nerve deafness	17	13	5	13	54 or more	15	3	3* 2** 1***

*Indicates approximately 25% improvement; **50%; ***75%; ****100%.

The improvement noted is based on the usual tests but principally on audiometer records. Ultraviolet irradiations were given as a routine measure in all cases of otosclerosis and nerve deafness, and in some cases of chronic catarrhal deafness.

Penetration of Ultraviolet Rays

It has been rather generally accepted as a fact that ultraviolet rays, especially the shorter ones, penetrate the skin to a very slight depth, sometimes stated as a fraction of a millimeter.

In J.A.M.A. for Jan. 21, 1928, Drs. D. I. Macht, Wm. T. Anderson and F. K. Bell report the results of a series of experiments made under exact and controlled laboratory conditions, which show that the ultraviolet rays penetrate much more deeply than has hitherto been supposed.

Experiments with a galvanometer showed that wave lengths of 4,050 millimicrons passed through 1.75 mm. of living skin to the extent of 16.3 percent; at 2,800 millimicrons, 56.3 percent passed; and at 2,537 millimicrons, 42.8 percent.

The authors sum up their conclusions as follows:

1.—The penetration of ultraviolet rays through living animal tissue was studied in two ways: by means of the spectrograph, on the one hand, and by means of a thermopile, on the other hand.

2.—It was definitely established that penetration of ultraviolet rays through the living skin and other tissues is much greater than has hitherto been supposed.

3.—Some of the shorter ultraviolet rays penetrate through the living skin more deeply than the longer ultraviolet rays.

4.—A marked difference was noted between the living skin and the dead skin.

5.—White human skin is more permeable to ultraviolet irradiations than negro skin on account of the presence of pigments in the latter.

6.—These observations have been carefully checked and repeated. They also agree completely with the latest and most reliable clinical experience of other authors.

Diathermy for the Relief of Pain

The most useful application available for the relief of pain is conversive heat, as induced in the tissues themselves by their resistance to the passage of the high-frequency current, commonly designated as diathermy. By the intelligent employment of this agency heat can be applied to the site of inflammation in any organ or tissue of the body.

This therapy is applicable in all stages to inflamed tissues, promoting the absorption of exudates and thereby relieving the pain of which the patient complains.—Dr. C. A. Smith, Seattle, Wash., in *Northwest Med.*, March, 1928.

Peripheral Facial Paralysis

In general, the treatment of the ordinary type of peripheral facial paralysis without nerve action is as follows: If there is much pain, positive galvanism, for its sedative effect, should be employed over the painful area; while conversely, if there is little pain, negative galvanism for its stimulative properties is indicated.

Next, some form of electric stimulation is necessary; the particular type depends on the degree of degeneration and the time that has elapsed since the onset of the attack. During the first ten days, interrupted galvanism only should be used, the polarity depending on which pole gives the greater mechanical response. After ten days, employ the type of electricity which will give the greatest degree of muscular contraction with the smallest amount of current. The moment the muscles show signs of tire, as evidenced by lesser amplitude of contractions, stop the treatment.

In many textbooks the statement is made that physical therapy, especially electrotherapy, *may* be of value *after* the painful stage has passed. This is erroneous, as not only are the results better the earlier the treatment, but by rapid amelioration of pain the patient is spared much suffering.—Dr. Frank B. Granger, Boston, in *Internat J. Med. and Surg.*, July, 1927.

Radiant Light in Gonorrheal Ophthalmia

The technic of radiant light therapy of gonorrheal ophthalmia, described by Dr. J. J. P. Armstrong, Douglas, Ariz., in *Phys. Therap.*, April, 1928, is as follows:

Lay the patient on a couch; wash eyes with boric acid solution externally; cover face and forehead with towels; use a deep therapy lamp of 1,500 watts with white globe on a movable stand, which can be raised or lowered and which is brought over the patient's face at a distance of 18 inches and gradually raised to 25 or 30 inches, according to tolerance, and left for one hour; wipe off tears and pus as they appear; wash the eye with boric acid solution and instil a few drops of agyrol; this is done twice a day.

The patient is sent home and directed to apply pledgets of absorbent cotton wrung out of a hot Epsom salt solution every 15 minutes, and a few drops of a freshly-made, 20-percent solution of argyrol are instilled into the eyes every four hours. As soon as the inflammation is cleared up, give drops of

℞ Zinc sulph. c.p.....gr. ¼ (0.016)
Sod. sulph. c.p.....gr. 2 (0.130)
Aq. rosae.....drams 2 (8.000)
Aq. dist. q.s. ad.....dram 4 (16.000)

to be used every 2 or 3 hours.

The number of treatments in 68 cases ran from 8 to 14 to be effective.

Physical Therapy of Benign Cutaneous Tumors

There are certain types of nonmalignant growths which are constanly brought to the attention of the physician for diagnosis and, when they constitute a cosmetic blemish, for removal. In *Am. Med.*, May, 1928, Dr. Oscar L. Levin, of New York, states that whether or not such particular growths should be removed must be left to the judgment of the physician.

Some tumors, although essentially benign in nature, may be potentially dangerous, especially if they are pigmented. Depending upon the location, size and duration, immediate removal may be indicated to avoid any possibility of

future danger from degeneration. Such degeneration may, it is true, never take place, but if the lesion is so situated as to be irritated in any way, it is advisable to have it properly removed. Treatment of small growths and tumors is indicated, not only when they are potentially dangerous, but often merely because they are disfiguring.

The public has been so thoroughly warned against neglecting to investigate the nature of a cutaneous growth that practically any type of almost imperceptible elevation is brought to the physician's attention for treatment.

The physician must determine, above all else, whether or not removal is advisable, and if it is, just what procedure would give the best results, both from the point of view of the health of the patient and the cosmetic effect.

There is a fairly wide range of selection among the numerous excellent physical therapeutic agents for the treatment of benign new growths. These agents, including electrolysis, carbon dioxide snow, endothermy, fulguration, electrocautery, phototherapy and radiotherapy, have all been used with varying degrees of success. The chief contributing factors to the success of the operation are the establishment of a correct diagnosis of the lesion in question, differentiating it from others which resemble it, proper judgment in the choice of treatment, and complete destruction of the lesion.

Ultraviolet Radiation and Syphilis

Drs. E. Rajka and E. Radnai, in *Wien. Klin. Wchnschr.*, Jan. 12, 1928, subjected 13 patients with positive Wassermann reactions to quartz lamp radiation. In 9 of the 13 the luetin cutaneous test was positive. Four (or perhaps 5) of the patients became Wassermann negative after radiation. In all of the 13 cases the ordinary chemospecific treatment had failed.

In regard to the effect of radiation on the cutaneous luetin test: of the 9 in which this test had been positive, radiation produced no effect in 1; in the other 8 it was clearly intensified, even in cases in which the initial luetin reaction had been weakened by chemospecific treatment. In the majority of cases radiation heightened the cutaneous anaphylaxis toward luetin permanently, although chemospecific treatment was again administered.

Several authors record that the intensification of cutaneous anaphylaxis in syphilis signifies an intensive destruction of spirochetes and the protection of the internal organs from the further spread of the pathologic process.

How Diathermy Acts in Infections

In bacterial infections, especially gonococcic, diathermy acts strongly upon the leukocytes. There is no direct action upon the polymorphonuclears, but the action takes place through the intermediary action of the microbes. The d'Arsonval currents have the property of setting free the bacterial toxins, which act upon the human organism in such a way as to cause a polynucleosis. The bodies of the bacteria themselves have no action—they are foreign bodies to be eliminated.

As to the polynucleosis, it is concerned with the elimination of the toxins, even though no traces of the bacteria are to be seen in them. It is for this reason that, after the disappearance of toxins, the formation of the polynuclears ceases, in spite of the continuance of the diathermy.

It is necessary to make repeated blood examination before, during and immediately after the entire course of diathermy, and this should be continued until the disappearance of polynuclears and until epithelial cells and mucus are no longer found.—Dr. E. Roucayrol, Paris, France, in *Urol. & Cutan. Rev.*, June, 1928.

Electrotherapeutic Agents and Their Special Indications

Precisely as we have a choice between jalap, castor oil, an enema, and various other mild and heroic means of relieving an overloaded intestinal canal; or can choose between morphine, bromides or chloral for the relief of pain or discomfort; and so on with the rest of the materia medica, we can just as accurately and even more conveniently pick out the electrotherapy that shall serve our desired therapeutic purpose best.

Polypharmacy is not considered particularly indicative of the best type of therapeutic reasoning; neither is polyelectrotherapy, polysyllabically or therapeutically, to be commended. Nevertheless, effective electrotherapy will be found—like efficient drug therapy—to consist, not alone in applying the single remedy occasionally found all sufficient, but in synergistically combining a minimum of required agencies for maximum effects.

The more accurate our diagnosis and the more exact our knowledge of the physics and physiologic reactions peculiar to the different electrotherapy treatments or agencies available, the more extensive will be the therapeutic results attainable and with least outlay in time and money, for both patient and physician. — Dr. J. E. G. Waddington, Detroit, in *Med. Herald & Physiotherapist*, June, 1928.

High-Frequency Currents in General Practice

Some points brought out by Dr. D. F. Knotts, of Chicago, in *Arch. Phys. Therapy. X-Ray, Radium*, Feb., 1928, are that it is possible, not only to destroy diseased tonsils in the office, by the high frequency current, without bleeding or pain, but there is practically no edema, soreness nor bleeding following the operation.

There is an advantage in having the current pass through the liver, gall-bladder and pancreas, which can be effected by placing one electrode over these organs. It increases the blood supply, stimulates circulation and thins the bile.

In treating aged, debilitated or toxic patients, or those who do not perspire freely, the amount of current and time of treatment are increased very gradually, because such patients are not in a position to eliminate the increased liberated toxins rapidly.

Autocondensation is a very valuable agent in old, chronic conditions and when it is desired

to hasten metabolism. Cases of diabetes or patients with large diabetic ulcers are rapidly relieved by autocondensation. After ten minutes exposure, ulcers are dressed with an ointment composed of equal parts of bismuth subgallate, zinc oxide and talcum powder, with a vaseline base.

Chronic prostatitis, seminal vesiculitis, menstrual disorders, fibrosis of joints and osteomyelitis are other conditions which give good results following diathermy.

The Ultraviolet Rays in Genitourinary Work

Dr. A. Bernay, Lyons, France, in *Urol. & Cutan. Rev.*, June, 1928, states that the ultraviolet ray ought to be an agent of the first importance in the rapid disinfection of the genitourinary tract. He has perfected an apparatus which permits the application of the rays to the urethra, bladder and uterus.

For the bladder, the instrument is called an ultraviolet vesical sound; it has the appearance of a cystoscope and is introduced into the bladder in much the same way. It contains a burner, in the interior of which a drop of mercury is placed, the vaporization of which under the influence of a high-frequency current (which can be generated there), creates the ultraviolet rays.

Quartz burners give off only the ultraviolet rays without the high-frequency spark which is annoying and also diminishes the emission of these rays.

There are modifications of this sound to suit the urethra, prostate and uterus.

The author gives a number of indications for the employment of this apparatus. In the male, ordinary gonorrheal cystitis, other bacterial infections, bladder tuberculosis very specially, certain phases of early prostatic hypertrophy, gonorrheal urethritis, etc. In the female, cystitis, urethral infections, metritis, etc.

As this method is only in its infancy the author thinks that in time the indications will be much extended and the various technics improved.

Indirect Radiotherapy of Lichen Planus

Dr. Alberic Marin, in *Med. Rev. of Reviews*, May, 1928, calls attention to the remarkable successes of indirect irradiation of that type of lichen planus called Wilson's; i.e., irradiation of that part of the vertebral column whose innervation corresponds to the sites of the lesions.

For trunk lesions, one skin unit, unfiltered, voltage 80 kilovolts, is given over the upper dorsal region between the scapulae, the tube being centered on the 4th or 5th dorsal vertebra. If papules are present on the legs, the same dose is given on the lumbar region, the anode being placed over the 3rd lumbar vertebra.

Lichen planus of the buccal mucosa is treated by irradiation of the cervical region.

Itching, burning and congestion may become more severe during the 24 hours following treatment; pruritus usually disappears by the second or third day following the raying; and by a month later, only a slight pigmentation can be seen on the former sites of the papules.

French dermatologists who initiated this mode of treatment are enthusiastic concerning it and claim a very high percentage of favorable results.

Removal of Neoplasms by Endothermy

Dr. Geo. A. Wyeth, of New York, in *Am. J. Surg.*, April, 1928, expands the theme that, in destruction of malignant lesions, "the only certain method is that of heat."

Removal of a neoplasm by surgical diathermy ensures against recurrence in the site and the endotherm knife was developed to prevent the recurrences often found in the scalpel incision.

In the treatment of localized malignant tumors which can be immediately removed by endothermy, the author no longer uses the roentgen ray or radium.

Although surgery still remains the cancer sufferer's chief hope, it is as wrong to cut all cancers as it is to treat all cancers by physical therapy.

The author refers to the opinion, expressed by Judd, of the Mayo Clinic, and others, that for growths too extensive for radical surgery, diathermy offers the best prospect. The author would extend this by affirming that a remedy which offers the best prospect in cases too extensive for scalpel removal offers also the best prospect in cases not too extensive for scalpel removal.

In mouth and breast cancers, endothermy offers the best procedure, the lymphatics are sealed and recurrences guarded against more effectively than by radical, destructive operations. Kelly, of Baltimore, endorses this view so far as shortening the operation and decreasing the handling of the wound is concerned.

Epididymis Clamp for Diathermy

Dr. Albert Crance, of Geneva, N. Y., in *J. Urol.*, May, 1928, describes a new epididymis clamp for diathermy, designed to overcome the objections in readjusting set-screw instruments.

In the new instrument the firmness of the grip can be entirely controlled with the forceps type of handles which eliminate all inconvenience in the matter of adjustment. If, during the course of a treatment, it becomes necessary to increase the tension of the instrument on the scrotum, the procedure is accomplished by merely closing up one notch with the ring handles. Likewise if too tight, the instrument may be released by opening the ring handles. No set-screw adjustment is necessary. The clamp is provided with a spring lock between the ring handles and a joint which keeps the tension at any point desired.

Leukorrhea

There are three chief groups of leukorrhea: the neurotic, the reflex and that due to chronic inflammation of the cervical mucous glands.

In the first group, a careful explanation of the cause and nature of the condition is the most important thing in treatment.

In the second type, the nervous condition originating the local circulatory changes must be sought and rectified.

In the third, the most numerous, type, local tampons may occasionally serve, but in advanced

cases diathermy is most frequently applicable. With an indifferent electrode placed on a distant part of the body and an aluminum needle as the active electrode, the diseased tissue may be coagulated and destroyed, giving the same effect as surgery.—Dr. M. J. Breuer, Lincoln, Nebr., in *Med. Herald*, April, 1928.

Low Voltage in Electrotherapy

Dr. Norman E. Titus, New York, in *M.J. and Record*, May 2, 1928, says that the Morse wave generator produces an alternating current which is three times as fast as ordinary alternating current; namely, 180 cycles a second.

It has been found that this speed of alternation makes the current sufficiently powerful to penetrate through slight resistances, and still the current is not too fast in its change of polarity to lose its ability to stimulate motor nerves causing muscular contractions. This current is ideal in causing muscular exercise of flaccid muscles, especially those which are so from disuse. The alternating characteristic of this current enables it to penetrate through the abdomen and cause contractions of intestinal muscles. Ordinary galvanism will not do this in moderate doses, as the galvanic current always prefers to take the path of least resistance, and hence, in the abdomen, will pass around the abdominal cavity via the external muscles or peritoneum.

The Sinusoidal Current

I know of no more startling results than those obtained by the use of the sine wave in atony of the large bowel which results in constipation. Mechanical exercise of these muscles reestabishes the normal integrity—a reeducating and a rebuilding process.

Muscles congested and stiff from nonuse, after fractures and dislocations, are hastened to resolution with a few graduated applications, and by contraction, circulation is enhanced and infection prevented.—Dr. W. Scott Keyting, Salt Lake City, in *Northwest Med.*, March, 1928.

Artificial Light Therapy of Tuberculosis

Dr. Ove Strandberg, of Copenhagen, Denmark, in *J.A.M.A.*, May 19, 1928, gives the result of carbon arc light bath treatment of tuberculosis at the Finsen institute in Copenhagen. Of 435 patients with rhinolaryngologic lupus vulgaris, cures were effected in 86.6 percent; some of these have been observed for as long as ten years without relapse.

In 41 cases of aural tuberculosis, treated by operation and light, only 9 ears are not dry. One patient died of pulmonary tuberculosis long after the operation; in all other cases the retroauricular lesion has healed and in 23 the author has succeeded in avoiding radical operation.

Altogether, 203 patients with severe tuberculosis of the larynx have been treated, all of whom had pulmonary tuberculosis also. Seventy-nine discontinued treatment before they were completely cured or because they could not, for other reasons, continue. The larynx was cured in 133 patients (55.6 percent). Of the 113 cured patients, 77 had pure intrinsic disturbances; 34 had both intrinsic and extrinsic; and 2 had extrinsic only. From this it may be concluded that, in light treatment, Sir St. Clair Thomsen's postulate regarding the greater danger in extrinsic tuberculosis is c o r r e c t; namely, that the percentage of cures in patients with this form of tuberculosis is perceptibly lower than in patients with only intrinsic involvement. After treatment the voice became clear in 90 cases.

Physical Methods in the Treatment of Constipation

Constipation may result from a number of causes, either direct or indirect. In *Med. Rev. of Rev.*, Oct., 1927, Dr. Wm. Wolf states that no single method of treatment of constipation has given better results, when properly employed, than the socalled sinusoidal stimulations in their various forms, either alone or combined with other electric agencies, notably diathermy and static electricity. At times, amazing results may be obtained by this method, and it will help to correct constipation resulting from various different causes. It will correct s l u g g i s h peristalsis by causing the intestine to contract more forcibly and in the proper rhythm; it will also correct a spastic and too rapid contraction of the intestinal walls by forcing them to contract rhythmically; the circulation is greatly stimulated, so that congestions are promptly relieved; the intestinal glands, as well as the pancreas and liver, are caused to pour out a greater quantity and a better quality of secretion; the abdominal muscles are strengthened, which is of importance when, as often happens, these walls are lax; lymph is more forcibly pumped through its circulation and a more rapid absorption of food materials into the system results.

The procedure, in most cases, ordinarily consists of either placing two electrodes alongside the spine in the dorsal region, having the seventh and eighth dorsal vertebra as the center, and passing the sinusoidal current from one electrode through the spinal nerves to the other, and thus causing a contraction of all the voluntary and involuntary muscles innervated by these spinal nerves; or placing one large electrode on the back, covering the d o r s a l region, and another smaller one upon the abdominal wall and moving it around in the direction of the course of the colon.

Treatment of Nevi

Dr. Jos. V. Klauder, of Philadelphia, in *J.A.M.A.*, June 2, 1928, says that the high-frequency current is more useful and more generally the method of choice in the treatment of nevi than any other agent; it can be advantageously employed in the treatment of all types of nevi. Electrodesiccation (by the monopolar current) is employed for surface destruction. Electrocoagulation is a more intensive penetrating destruction

of tissues by a bipolar high-frequency current. The endotherm knife is a term employed to designate tissue cutting by means of oscillations of the high frequency current.

Electrodesiccation is employed in the destruction of small or moderate sized nevi, whereas electrocoagulation is employed in the treatment of massive types of nevi, and in these types the endotherm knife may also be used, especially when elevated tissue must be removed. With the endotherm knife, bleeding can be better controlled and healing is perhaps quicker.

The proper current strength to be employed depends on the size of the lesion and must be learned by experience.

To prevent infection, the author uses wet compresses of solution of chlorinated soda, 1:20 as a wound dressing. Exposure of the wound to the sun or to ultraviolet ray expedites healing.

Destruction of premalignant nevi should be thorough and complete and cosmetic results should be secondary. Such destruction is best accomplished by electrodesiccation or electrocoagulation. Incomplete methods are dangerous and expedite malignancy.

Illnesses Caused by Excessive Physical Therapeutics

Rules for the application of physical agencies in diseases do not apply universally, as shown by Dr. W. W. Dukes, Kansas City, in *Arch. of Phys. Therap. X-Ray, Radium*, May, 1928.

In some individuals, sensitive to the action of one or more physical agents, their application, even in moderate doses, causes harmful or even dangerous results, and these results are often very severe.

The symptoms observed can be classified under such terms as urticaria and dermatitis of greatest severity; vasomotor coryza, rhinitis, coughs or asthma; gastrointestinal disturbances; urologic disturbances or renal colic. These conditions are specific in sensitive individuals and are usually due to a specific physical agent. Some are affected by rays at the violet end of the spectrum only; other show symptoms after exposure to cold between 5° and 15°C., etc.

Brilliant therapeutic results can be obtained through the avoidance of the agent to which the patient is sensitive or through the appropriate application of this same agent in repeated, gradually increasing doses; i.e., through the use of increasing dosage of light in light-sensitive cases, heat in heat-sensitive cases, friction in friction-sensitive cases, etc., a degree of tolerance is reached which enables the patient to withstand such dosage as he encounters under natural conditions, and the agent previously harmful becomes beneficial.

Ultraviolet Treatment of Diphtheria Carriers

The problem of the diphtheria carrier is one that almost every physician has faced, and the multitude of the remedies suggested for clearing up the throat proves that there is, as yet, no specific.

In *Colorado Med.* for March, 1928, Dr. G. P. Lingenfelter makes a suggestion which once again inspires hope.

A series of 44 patients, known to be carriers for from three weeks to three years, were treated as follows:

The nose and throat were thoroughly irrigated, daily, with physiologic saline solution, followed by a solution of eosin. The accessible mucous membranes were then irradiated with a water-cooled, quartz-mercury lamp, using suitable quartz applicators, for increasing lengths of time, from 15 seconds to 2½ minutes, after which the entire body was exposed to the rays of an air-cooled lamp, for periods beginning with 2½ minutes and increasing to 20 minutes.

After from 3 to 27 treatments, 42 of the 44 patients gave three negative cultures and were released. Follow-up cultures were made after two weeks, when 2 of these patients were again positive and were returned for further treatment.

For successful results, these patients must be hospitalized, so that regularity and supervision may be assured. This treatment is impracticable in the home or office.

The theory of the method is that the ultraviolet irradiations build up the body's resistance and increase metabolism, thereby rendering the soil unfit for bacterial growth. The repeated applications of the rays from the water-cooled lamp serve to kill the successive crops of Klebs-Löffler bacilli as they come to the surface.

No method hitherto recommended for clearing up diphtheria carriers has given results so favorable as these.

The Council on Physical Therapy of the A. M. A.

The Council on Physical Therapy is attacking some wholly new problems in a field as yet inadequately explored, from a scientific standpoint. The manufacturers of physical therapy equipment are cooperating actively in placing physical therapy on a rational basis.

The committee on nomenclature is preparing a glossary of fully defined scientific terms and units and of terms peculiar to physical therapy.

The Council will investigate, not only apparatus for physical treatments, but also allied matters of general interest to physicians and to the public, such as the permeability of various kinds of glass to ultraviolet rays.—Dr. H. J. Holmquest, in *A.M.A. Bul.*, April, 1928.

Temperature and the X-Rays

From experimental work reported by Dr. A. Dognon, Strassburg, France, in *Arch. Phys. X-Ray, Radium*, Feb., 1928, it seems that the sensibility to x-rays varies greatly with the temperature. It is very probable that this is a general law which could be utilized in radiotherapy, either for the augmentation of the sensibility of the local regions of the skin, in the treatment of psoriasis, for example, or for its diminution in irradiation of a deep organ.

The study of the method of variation of sensibility with the temperature enables the factors of this sensibility to be analyzed, with recognition of that which composes it in at least two of its elements, one of which does

not vary, the other being an ordinary chemical reaction which varies very rapidly with the temperature. It is natural to assume that this chemical reaction precedes and permits the photochemical reactions with x-ray in causing the formation of a body usually destroyed by them.

Physical Therapy of Sinus Infections

Dr. F. T. Woodbury, New York, in *Arch. Phys. Therap. X-Ray, Radium*, Feb., 1928, gives first the main points of diagnosis of sinus diseases. Having removed obstructions by surgical procedures and treated lymphoid hypertrophy by x-rays, an application of radiotherapy from a carbon-filament lamp or a diathermy treatment will often produce a profuse, thick, green discharge from the infected sinus, thus obviating the necessity for surgical drainage.

The treatment consists of a tonic irradiation from a 20 to 25 ampere arc lamp, using plain carbon electrodes, for 20 minutes each to the back and front of the nude body. This is followed by diathermy through the sinuses where the deep ones are concerned, while radiotherapy may be employed for the entire antra and frontals. When one sinus is being treated, a large indifferent electrode may be employed on the back. Autocondensation will work as well as the d'Arsonval current, glass condenser electrodes being placed in the nostrils. The treatments number at least 20 and may be of 45 minutes duration.

The best electrode for facial contours is florist's lead foil.

The treatments are repeated every other day, in the chronic and sub-acute cases, with very mild doses of x-radiation. Where there is much turgescence, positive electrolysis is indicated, 5 to 10 milliamperes for 15 to 20 minutes, repeated if necessary.

In acute cases, an additional application of radiotherapy, usually from a 265-watt, carbon-filament lamp, for a period of 40 minutes, as closely as can be borne by the skin, will promptly abort the inflammation. This is important in acute nasal infections, especially in measles and other exanthems.

Actinotherapy

In an article on actinotherapy by Dr. Elizabeth M. Anderson, of Durham, Eng., in *The Prescriber*, April, 1928, it is stated:

That, on account of their high current consumption, necessitating heavy cabling, high amperage carbon arc lamps are suitable only for hospital use.

That all carbon arc lamps give a large percentage of infrared rays and luminous light but a relatively small percentage of ultraviolet rays.

That the spectrum of the tungsten arc lamp is extremely rich in ultraviolet rays.

That, of the three sources of ultraviolet rays, the mercury vapor lamp is the least reliable, as its output does not remain constant. With lamps of the open-arc pattern—either tungsten or carbon—if the factors of voltage, amperage, time of exposure, distance and composition of electrodes all remain constant, the amount of ultraviolet radiation given off also remains constant. With the quartz-mercury vapor lamp, the output varies with the type and age of lamp.

That, despite Rollier's dicta, pigmentation is no guide to the prognosis in actinotherapy; patients may thrive without any erythema or pigmentation being manifest.

That ultraviolet rays have the property of increasing the absorption and assimilation of various substances by the blood stream and drugs may be classified according to whether they are so affected or not. Calcium, phosphorus, iron, iodine, bromides, quinine and dried thyroid are among the substances influenced by ultraviolet radiation.

That certain foods taken within a few hours of radiation produce sensitization and urticaria.

Bucky's Transition Rays

About two years ago, according to Dr. H. Fuchs, writing in *Strahlentherapie* XXVI, No. 4, 1927, Bucky described a type of rays, lying between the x-rays and the ultraviolet radiations, which he called *transition rays*. These correspond, in some particulars to the soft roentgen rays, but they require a special tube for their production, and their action is entirely superficial. They are said to be wholly free from dangerous effects.

The author believes that these rays will be helpful in the treatment of many types of skin diseases, and has found them especially so in certain tuberculides (lupus, etc.), chronic lichen, mycosis fungoides and benign skin cancers. They are of some value in certain forms of eczema, but the results are not permanent.

Therapeutic Effects of Heat

In *Arch. Physical Therap.*, June, 1928, Dr. J. H. Kellogg, Battle Creek, Mich., dwells upon the superiority of luminous heat rays for therapeutic penetrative purposes, as compared with the darker heat rays.

Many years ago it was demonstrated that the electric light bath, as compared with the Turkish and the Russian, or hot air and vapor baths, produced: first, greater elimination of CO_2; second, a marked increase and earlier appearance of perspiration. Further investigations have since shown that the penetrating, luminous rays are capable of developing the muscles without the necessity of taking exercise; that the non-penetrating, infrared heat rays depress the neuro-muscular mechanism; that sunlight and arc-light baths increase the metabolic rate with less elevation of the general body temperature than do immersion baths and other means of applying heat.

For more than 25 years Dr. Kellogg has been convinced that the luminous radiant rays possess a high therapeutic value and that much of the benefit which has been attributed to the ultraviolet rays is really due to the vitalizing qualities of luminous heat rays.

By employing cooling measures (electric fan, sponging, etc.), so as to prevent overheating of the skin, the intensity of the light application

may be greatly increased and thus the effects upon the deep-lying tissues may be considerably enhanced.

Dr. Kellogg's views have also been confirmed by recent experiments of Sonne, who is convinced that the highest therapeutic potency is in the visible heat rays, especially in raising the temperature of subcutaneous tisues.

However, as a means of applying heat to deep-lying structures, diathermy has no rival and has acquired an established place in therapeutics for the management of disorders involving the stomach, gall-bladder, etc. The best results from the use of diathermy are obtained by combining it with alternate or simultaneous applications of radiant heat, both general and local

Physical Measures in Treating Backaches

Dr. F. E. Ewerhardt, St. Louis, in *Arch. Physical Therapy*, June, 1928, states:

1.—That the pain incident to chronic or static backache is due, to a greater or lesser extent, to strain, stress and overstimulation of muscles and ligaments comprising the hip girdle.

2.—That the condition is primarily due to incorrect body mechanics, reflecting itself particularly in the lower back: and that it can be traced directly to the kinetic sense apparatus in muscles, tendons and articular surfaces of the entire body.

3.—That weak muscles, *per se*, are not necessarily the cause of this condition, but rather that they more readily allow it to happen.

4.—That physical agents, like heat, hydriatics, exercise, massage and splinting, are probably the most valuable means of therapy at our command.

Infrared Radiation Hyperpyrexia

A number of observers have demonstrated that a temperature rise of several degrees could be produced to a depth of three inches in the body from an infrared radiation not sufficiently intense to cause a skin burn. In the *Med. Herald*, May, 1928, Dr. G. J. Warnshius, of Milwaukee, states that he has verified this fact.

Dr. Warnshius thinks that the therapeutic use of the infrared rays is indicated in muscular and other contractures; in extravasations; in hyperesthesia (pain), insomnia and other nervous disorders; in cardiac irregularities of nervous origin and in ischemic conditions.

The general results of heat therapy are sedative, restorative and eliminative. It is particularly valuable in the prevention and cure of wound infections, in otitis media, in skin diseases of all kinds except neoplasms, and in boils and carbuncles.

Physical Therapy of Rectal Diseases

Dr. Geo. J. Ott, Boston, in *Arch. Phys. Therap., X-Ray, Radium*, April, 1928, is of the opinion that mild diathermy (applied by means of a metal electrode, 4 by 7 inches, over the sacrum or the abdomen, and a metal electrode 2 inches in circumference and 4½ to 6 inches long, preferably hollow, in the rectum), with a current of from 400 to 800 milliamperes, passed through the pelvic area, will give decided relief in most cases of proctitis without stricture and with or without prostatic involvement, in ulcer, etc.

Vibration, using a conical glass vibratode with mild pressure and slow speed for 3 to 5 minutes, will relieve local spasm, itching and throbbing.

Galvanism is indicated in dyschesia, atonic rectal or sigmoid musculature, or partial paralysis of rectal circular fibers or anal distrusion of the sphincter muscles. Injection of 8 ounces of salt solution, to be retained throughout the 15 minutes treatment, is recommended.

Proctitis calls for diathermy with the metal electrode inserted; prolapse, for positive galvanism or paralleled striated electro-surgery; stricture, for negative galvanism.

The anesthetic, antispasmodic and solvent effects of the Tesla current, bipolar, makes it most beneficial in the treatment of anal fissure.

Any fissure that can be seen should be desiccated entirely.

For hemorrhoids, external or internal, first remove the toxins from the body. Treat the liver by means of diathermy, front and back, daily for about a week; clean out and strengthen the gastrointestinal tract, then desiccate.

Actinotherapy

It has been shown that ultraviolet rays exert a marked influence on the composition and properties of the blood. The actinic rays are absorbed by the blood circulating in the capillaries and cellular interspaces of the superficial layers of the skin, and cause biochemical changes. The calcium, iron, iodine and phosphorus content of the blood is raised, and the body is enabled to absorb those substances more readily, with cell-fixation. If the correct dose is administered, the bactericidal property of the blood is raised; if an over-dose is given, it is lowered.

The percentage of hemoglobin is also increased, as well as the number of red blood corpuscles when they are diminished, as in rickets and the simple anemias.

The general resistance is increased and the blood can more readily overcome bacterial invasion.—Dr. Elizabeth M. Anderson, in *The Prescriber*, Feb., 1928.

The Short Cold Bath

In *Am. J. of Surg.* for June, 1928, Dr. W. H. Riley, of Battle Creek, Mich., presents a very complete and instructive study of the effects of the short cold bath—meaning a bath at 90° to 55°F. for ½ to 3 minutes (usually 1 minute).

He finds that it *increases* the circulation and nutrition of the skin; muscle tone, endurance and capacity and the tone and nutrition of the heart muscle and of the blood vessels, thus stimulating and improving the circulation; the depth and rate of respiration, thus increasing the absorption and utilization of oxygen, the excretion of CO_2 and metabolism in general; and heat production and elimination.

It lessens muscular fatigue; increases the force and decreases the rate of the heart beat; affects the blood pressure by increasing the systolic and

decreasing the diastolic readings, thus augmenting the pulse pressure; increases the cellular elements of the blood and the hemoglobin; improves the appetite, stimulates digestion and peristalsis, thus helping to relieve constipation; increases the solid and fluid output of the kidneys and the irritability and conductivity of the nerves; and acts as a general systemic tonic.

The Blending of Physical Agents

Dr. J. U. Giesy, Salt Lake City, in *Arch. Phys. Therap. X-Ray, Radium*, May, 1922, states that every manifestation of energy is nothing more than a manifestation of a definite band in a spectrum of universal energy. These bands of definite manifestations shade and blend into each other quite as a matter of course. In this fact must be found the foundation for employing the various agents, light, heat, chemical ionization, electric currents, etc., in physical therapy.

The physical therapeutic prescription should be built up exactly as the internist writes a prescription consisting of one or a number of complementary drugs. The actual condition of the patient must determine whether it will best be affected by a chemical process, by thermal application, by mechanical or other methods.

The effects of the different agencies on the various pathologic conditions, inflammatory and other, should be fully understood and drugs prescribed as indicated, together with the physical therapy prescription. The blending of the different actions brought into play should be in the mind of the prescriber.

Hydrostatic Electrode

Occasions may arise indicating an electrode which, in a collapsed condition, can be placed within a body cavity, and then expanded to completely fill that cavity.

Dr. Lee A. Hadley, Syracuse, N. Y., in *Internat. J. Surg.*, March, 1928, describes such an electrode. It is a transparent tube, thin as paper, hydrostatic, and made from pulp wood, such as is now used for sausage casings, which is attached to an ordinary metal electrode furnished with a syringe tube. It is introduced within the part to be treated, then filled with water. Galvanism or high-frequency currents may be administered by this method to the vagina, rectum, stomach, etc.

Diathermy in Gynecologic Conditions

Dr. Mortimer N. Hyams, New York, in *Am. J. Obstet. and Gynec.*, Feb., 1928, gives his personal results with diathermy in certain gynecologic conditions as follows:

18 cases of condylomata lata, treated with perfect results.

2 cases of urethral caruncle, treated with more success than with surgery.

27 cases of acute gonorrheal urethritis in which the previously positive smears became negative after one to three treatments with diathermy.

16 patients with Skene's gland infection, cured.

Treatment of Bartholin gland infection with diathermy is of no avail.

In more than 30 cases of gonococcal endocervicitis, with carefully applied and painstaking technic, using the cervical electrode in the several positions suggested, the end results have been uniformly unsatisfactory.

About 50 percent of 38 patients with dysmenorrhea were relieved by diathermy.

In 46 patients with parametritis the results from diathermy have been extremely gratifying.

Of 22 patients with definite adnexal disease, in which diathermy was applied, 3 only came to operation. In 2 others the tumor mass persisted though diminished in size, but the symptoms were relieved.

Physical Therapy in Osteomyelitis

Dr. Philip H. Kreuscher, Chicago, in *Arch. Physical Therapy*, June, 1928, states that while osteomyelitis is primarily a surgical condition, yet physical therapy plays a great part in its treatment.

The bone should be kept entirely exposed. The direct application of heat, while it has advantages, is disadvantageous in that it favors bacterial growth.

Actinotherapy, in the form of the ultraviolet ray, is our greatest hope in the eradication of these infections. The element of heat is negligible and the rays may be carried directly into the deeper tissues.

The local application of the ultraviolet ray, either with or without the application of radiant heat, is not sufficient to bring about a favorable systemic reaction. It is necesary that the various portions of the body should be exposed and, if it is true that the rays are absorbed by the capillaries and larger blood vessels, then it would seem rational that chiefly those portions of the body be exposed where the vessels lie nearest the surface.

Physical Therapy in the Treatment of Obesity

Dr. Maximilian Kern, of Chicago, says, in *Archives of Physical Therapy* for June, 1928, that it is well known that the excessive or too-frequent exposure of children to ultraviolet rays causes a loss of excess weight.

The deposition of excess fat, by hibernating animals, prior to going into the resting state, seems to be due to some endocrine activity and to have a relation to ultraviolet exposure.

As a result of some uncompleted experiments, it seems probable (in view of the fact that all types of obesity are dependent on metabolic perversion, and hence require careful medical study), that there is some relation between ultraviolet and a hibernating vestige in human beings.

Sinusoidal and other forms of electric treatment, as well as high-frequency currents, have no sound basis in the treatment of obesity, but ultraviolet irradiations offer some hope of clinical value in such conditions.

Mental Diseases and Pregnancy

There are many obvious nervous and mental states which occur as a reaction to pregnancy.

Dr. O. B. Darden, Richmond, Va., in *Southern Med. and Surg.*, April, 1928, says that, in addi-

tion to physical and mental stress and strain, necessitating a readjustment in the normal woman during pregnancy, a tainted heredity or a predisposition to mental disease offers a fertile soil for the development of a psychosis. However, there is no psychosis characteristic of pregnancy and any form of mental disease may develop.

Prophylaxis by providing an atmosphere of contentment and happiness affords the best means of treating the mental disorders incident to pregnancy.

Home or Hospital for Obstetric Delivery?

In *Southern Med. and Surg.*, April, 1928, Dr. C. J. Andrews, of Norfolk, Va., says that 80 percent of all deliveries are normal and may be cared for at home, provided suitable attention is available. The complicated or abnormal cases should be treated in hospital, but this necessitates an accurate diagnosis of such conditions; that is, an efficient prenatal service.

The principal conditions that call for hospital service are: cases with contracted pelves; cases with normal pelvic measurement but with a disproportionate fetus; cases in which there is causeless, painless uterine bleeding during pregnancy; few toxemia cases which have received proper prenatal care should need hospitalization; cases of abortion should be sent to hospital, and also every multipara who gives a history of previous difficult labor.

The function of a free hospital obstetric service is twofold: the prenatal clinic to prevent morbidity and diagnose abnormalities, and hospital service for the complicated cases.

Gelatin in Medicine

Gelatin spares protein, but is itself an incomplete protein; it shows much promise as an infant food, especially as a milk diluent; the value of gelatin as a hemostatic has long been known.

The therapeutic uses of gelatin include its use in internal or external hemorrhages (internally 180 cc. of a 10-percent solution, twice in 24 hours); also the injection of sterilized gelatin in bladder hemorrhage.

Gelatin is used in adult dietaries for its known caloric value.—G. D. Beal and A. Neff, in *J. Am. Pharmacol. Assn.*, March, 1928.

Investment Suggestion

If the owner of a house intends to hold it for his own use, his assets are more liquid and better diversified if he retains a moderate sized mortgage on his buildings, and places the funds which otherwise would have been used to retire the mortgage, into a diversified list of high-grade stocks and bonds.—Merryle S. Rukeyser, in *Med. Economics*, April, 1928.

Resistance to Streptococcic Infection Increased by Irradiation

Dr. Franz Bass, in *Zentralbl. f. Gynaek*, Jan. 14, 1928, claims to have proved, by animal experiments, that the local application of x-rays increases the resistance of the organism to streptococcic infection. Following infection with a lethal dose, irradiated animals lived for from 5 to 10 days longer than control animals and bacterial counts revealed fewer germs in the irradiated than in non-irradiated animals.

The basis of the therapeutic action is considered to lie in the fact that x-rays activate the reticulo-endothelial system and that the system absorbs the organisms and destroys them.

If these findings are verified, a new method of treating inflammatory disease is offered.

Safety in Nitrous Oxide-Oxygen Anesthesia

If an inhalation anesthetic is used, gas should be the choice. Its sole danger is in the interference with oxidation. Since death from nitrous oxide is caused by asphyxiation, I believe that nitrous oxide is not dangerous if the patient's color is kept good. This is best observed by noting the condition of the blood. The surgeon and his assistants become accustomed to observing the blood and to noticing immediately the slightest change from a bright scarlet hue. It is only necessary for the surgeon to say "a little dark" for the anesthetist to bring back instantly the bright color. There is no other anesthetic which has such a clear, definite, warning signal. Nothing can be wrong with a patient who has a good color. If this fact is observed and if the heart is watched while anesthesia is induced, there is no danger.—Dr. G. A. Haveman, Columbus, O., in *J.A.M.A.*, May 26, 1928.

Lipoids in the Urine

Under normal conditions lipoids cannot be observed in the urine, so long as the kidney is not affected.

Dr. Ed. L. Miloslavich, Milwaukee, states in *J. Lab. & Clin. Med.*, March, 1928, that lipoiduria (the occurrence of double refracting fat substances in urine) occurs in the following pathologic conditions:

1.—Lipoid nephrosis of unknown origin (genuine lipoid nephrosis);

2.—Lipoid nephrosis due to syphilis (secondary stage of syphilis);

3.—Subacute and chronic glomerulo-nephritis;

4.—Amyloid nephrosis, with edema;

5.—Grawitz tumor (hypernephroma) of the kidney;

6.—Lipoid carcinoma of the prostate.

NEW BOOKS

Kellogg: Light Therapeutics

LIGHT THERAPEUTICS. *A Practical Manual of Phototherapy for the Student and the Practitioner. By John Harvey Kellogg, M.D., Author of "Rational Hydrotherapy", etc.; Fellow of the British Royal Society of Medicine, Fellow of the American College of Surgeons; etc. Battle Creek, Mich.: The Modern Medicine Pub. Co. 1927. Price* $3.00.

From several points of view the appearance of Dr. Kellogg's book is a matter of great interest and gratification to physical therapists: First, because Dr. Kellogg is the pioneer who introduced the first incandescent light bath into the United States, in 1891; second, because he has been a most potent and enthusiastic force in promulgating and improving methods of physical therapy in general; third, and most important, because the book now issued comes from one who, owing to his long experience of more than 50 years, may be considered as an outstanding authority on the subject treated.

The first edition of this book appeared in 1910. At that period an attempt was made at the Battle Creek Sanitarium to correlate the light bath to other rational physical therapeutic procedures, and the same principle is observed throughout the present edition. The energy derived from light is therapeutically associated with the advantages derivable from hydrotherapy, direct electricity, thermotherapy, diet, etc. (all of which are described and illustrated); but Dr. Kellogg considers that light is one of the most potent physical agents available.

The author states that the purpose of his book is to present in a concise way the fundamental facts of light physics, together with a brief description of light appliances and the technic of their application, with a summary of the progress in clinical light therapy in recent years. These objects appear to have been fully accomplished in the eleven chapters which form the book.

The language is clear, precise and succinct; unnecessary technicalities are avoided and any physician can easily understand the descriptions. There are numerous illustrations.

A volume of helpful clinical suggestions for the practitioner or physical therapist.

Grover: High Frequency Practice

HIGH FREQUENCY PRACTICE. *For Practitioners and Students. By Burton Baker Grover, M.D., Author of Handbook of Electrotherapy; President of Western School of Physical Therapy; etc. Illustrated with Engravings. Thoroughly Revised and Rewritten. Fifth Edition. Kansas City: The Electron Press.* 1928. *Price* $6.00.

Dr. Grover's book may be classified as a very complete and practical exposition of the technic and practice of high-frequency current therapy at the present time. In this fifth edition advantage has been taken to bring the book into harmony with all recent accepted standard methods and terminology. The chapter on "Diathermy in Gynecology" has been contributed by Dr. A. D. Willmoth.

The matter is characterized throughout by a modest tone. Dr. Grover recognizes the limits of the subject; that while it has definite indications, for which it is best suited as a therapeutic agent, it is only a part of the practitioner's armamentarium in dealing with disease. No exaggerated claims are put forward for electricity as a panacea.

There are 19 chapters. The opening ones deal with the generalities of the subject, and the others each deal with regional pathologic conditions in which high-frequency currents are applicable. The technic in these different applications is fully described.

An appendix, in the form of a questionnaire, a glossary and bibliographic references complete the text.

The book is written in clear language with avoidance of unnecessary technicalities and formulas, and will be easily followed by the general practitioner and student not possessing any special knowledge of the subject. For the practitioner who uses electrical diathermy as a part of his current practice this work should prove decidedly helpful.

Wyeth: Surgery by Electrothermic Methods

SURGERY OF NEOPLASTIC DISEASES BY ELECTROTHERMIC METHODS. *By George A. Wyeth, M.D., New York. Preface by Howard A. Kelly, M.D., Baltimore. With One Hundred and Thirty-Seven Illustrations. New York: Paul B. Hoeber, Inc.* 1926. *Price* $7.50.

Much confusion exists in regard to the terms commonly used to denote the medical and surgical uses of high-frequency currents; the purposes in each class of work are quite distinct and generally well understood by the profession.

The author suggests the term *endothermy* to include all forms of surgical application of high-frequency currents; namely, dessication, coagulation and the endotherm knife, in which the heat is generated *within* the tissues, as opposed to *fulguration* and *cauterization*, in which the heat is transmitted to the tissues from a source *external* to them. The endotherm knife is always cold when applied and the heat which it generates in the tissues does not char or burn: it coagulates or dessicates the tissues and seals the lymphatics.

In this book, the author describes especially the mode of application of this endotherm knife

to the removal of accessible neoplasms. "Knife" is used merely in the cutting sense, the cutter being a current, operating through a needle.

Of the ten chapters which compose this volume, the first six are devoted to the descriptions of the currents and their modes of application. The last four chapters show the applications of endothermy to malignant and other growths, in various regions. There are numerous clarifying illustrations.

There seems to be little doubt, from the clear descriptions and case reports given by the author, that this surgical method is far more applicable in many conditions of malignant disease than the older scalpel method. In bladder cancer, breast cancer and a number of other conditions this method seems to be indicated. Furthermore, it can be combined with ordinary surgery, the later being used to open up the region and the endothermy being applied for the tumor removal.

Although only in use to a practical degree for a few years, all the results are, so far, full of promise and it seems very probable that as a surgical method it has a far more extensive future. For this reason every surgeon—in fact every physician—ought to be cognizant of its nature and possibilities.

Rosewarne: Actinotherapy

A Text-Book of Actinotherapy. *With Special Reference to Ultraviolet Radiation. For Practitioners and Students. By D. D. Rosewarne, M.R.C.S. (Eng.) L.R.C.P. (Lond.), Late Honorary Actino-Therapeutist and Assistant Physician, City of London and East London Dispensary, etc. With 20 Illustrations. Including a Colored Plate. St. Louis: The C. V. Mosby Company.* 1928. *Price* $4.00.

This is a good book for the student or practitioner who desires to make himself fully acquainted with the fundamental physical facts underlying the now advanced practice of actinotherapy. It is an elementary textbook on the subject.

The author has kept the student's point of view in mind all the time and, in his descriptions of the essentials, every effort has been made to state the subject matter in the simplest terms. This is important for those who feel that their knowledge of the physics and chemistry of light is either insufficient or else has become more or less hazy.

The book consists of three parts: the physical and chemical action of light; the biologic action of light; and clinical procedures. Illustrations and diagrams are supplied when necessary.

Clayton: Therapeutic Exercise and Massage

Physio-Therapy in General Practice *And for the Use of Masseuses. By E. Bellis Clayton, M.B., B.Ch. (Cantab.), Director of the Physio-Therapeutic Department, and in Charge of the Massage and Electrical School, King's College Hospital, London. New York: William Wood and Company.* 1924. *Price* $3.50.

This book has been written for medical practitioners but especially for massage technicians. Although a short mention is made of radiant heat and electric currents, the bulk of the book is devoted to the description of various exercises, passive and active, called for in certain pathologic conditions.

The treatments are based on the principles employed in the physio-therapeutic department of the King's College Hospital, London. As a series of well-founded and orderly physical exercises, to be given under medical supervision and applicable to pathologic conditions in different regions, the contents of this book should be valuable.

Hall: Ultraviolet Rays

Ultraviolet Rays in the Treatment and Cure of Disease. *By Percy Hall, M.R.C.S. (Eng.), L.R.C.P. (Lond.), Hon. Actino-Therapist, The Mount Vernon Hospital, London and Northwood; etc. With Introductions by Sir Henry Gauvain, M.A., M.D., M.C. (Camb.), F.R.C.S., and Leonard E. Hill, M.B. (Lond.), F.R.S. Third Edition. St. Louis: The C. V. Mosby Company.* 1928. *Price* $4.50.

A book of twenty-six short chapters which tells all that is necessary to give any practitioner an insight into the physics and therapeutic action of the ultraviolet rays.

Half of the book is devoted to descriptions of the rays and their properties, as well as those of different apparatus. The second half is taken up with conservative clinical applications of the rays in different pathologic conditions.

One chapter is devoted to a description of the Municipal Light Clinic in the City of Hull, England, the pioneer of its kind in the British Empire.

The book was originally published in 1924 and it has now run into three editions. It is a good one for a novice who is not acquainted with actinotherapy.

Massey & Morse: Galvanic and Low-Voltage Currents

Galvanic Currents and Low Voltage Wave Currents in Physical Therapy. *By G. Betton Massey, M.D., Fellow and Former President American Electrotherapeutic Association; etc.; and Frederick H. Morse, M.D., Fellow and Former President American Electrotherapeutic Association; etc. Boston, Mass.: The Falcon Press, 36 India St.* 1927. *Price* $6.00.

In the great impetus which has been given during recent years to physical therapy, probably electrotherapy, either by direct or alternating currents, has occupied the most prominent position.

Drs. Massey and Morse are well-known pioneers in the field of application of galvanic and low-voltage electric currents to therapeutics, and the present book is a clear exposition of their views, written so that the busy practitioner, who desires to add this form of therapy to his armamentarium and who has but little time to pursue exhaustive treatises, may learn all the essential facts rapidly.

In the first part of the book, consisting of 18 short chapters, the physical properties and therapeutic action of the direct galvanic and low-voltage wave currents are explained. This includes their application in various special lines of medical practice—dermatology, ophthalmology, etc.

The second part of the book treats of low voltage alternating currents, to which five chapters are devoted. This type of current is, according to the authors, more particularly applicable to intestinal affections, and radiographs, taken under varying conditions, illustrate the effects.

This book is eminently a practical treatise without any superfluous padding. It should form part of the library of every one interested in the subject of medical electricity.

Brugsch and Schittenhelm: Laboratory Technic

KLINISCHE LABORATORIUMSTECHNIK. *Herausgegeben von Prof. Dr. Theodor Brugsch und Prof. Dr. Alfred Schittenhelm, Zweite, vollständig neu bearbeitete Auflage der "Technik der speziellen Klinischen Untersuchungsmethoden". III Band. Mit 144 Abbildungen im Text, einer farbigen und einer schwarzen Tafel. Berlin and Wien: Urban & Schwarzenberg.* 1928. *Price, geh. RM 32.-; geb. RB 35.-*

This is Volume 3 of the second edition of the authors' extension of their "Technik der Speziellen Untersuchungesmethoden". It includes the functional testing of the circulatory organs, principal abdominal viscera, endocrine glands and "Sportsphysiologie". The latter term includes the special conditions arising in all kinds of athletes.

The book is essentially one for the laboratory technician.

Foerster: Painful Conditions

DIE LEITUNGBAHNEN DES SCHMERZGEFÜHLS UND DIE CHIRURGISCHE BEHANDLUNG DER SCHMERZZUSTÄNDE. (*Paths of Conduction of the Sensation of Pain and Surgical Treatment of Painful Conditions*). *By Professor Dr. O. Foerster, of Breslau. With 104 illustrations. Berlin: Urban und Schwarzenberg.* 1927. *Price: Mk.* 19.50.

While apparently intended for specialistic surgeons, this monograph will also prove helpful to neurologists. It is the outcome of a conference of German surgeons, held a little over a year ago, and at the end of the volume are a number of discussions by Payr, Krause, Küstner, Küttner and others.

Of 360 pages of text, 177 deal with the anatomy of the nerve paths as pain conductors, while in the remaining part of the work the affections of the peripheral nerves, spinal ganglia, spinal roots, spinal cord, meninges and brain come in for discussion, with reference to surgical intervention.

G.M.B.

Pigott: Religion

RELIGION FOR BEGINNERS. *By F. W. Pigott, M.A. (Oxon), Regionary Bishop of the Liberal Catholic Church for Great Britain and Ireland. London: The Theosophical Publishing House, Ltd.* 1928. (*Through The Theosophical Press, Wheaton, Ill.*). *Price* $1.75.

The young people of today are finding orthodox religious presentations largely unsuited to their needs, but here is a book, written especially for those between 16 and 20 years old (but suited to the needs of all who are just beginning the real study of religion), and setting forth the old and fundamental truths upon a sound basis of scientific philosophy.

The language and the logic are simple and direct, so that, though the author deals with some of the profoundest conceptions, such as the nature of God, the purpose of Creation, the nature of right and wrong, and many other matters, there is no difficulty in grasping his meaning.

This is a volume which should be widely read (a good book for the table in the waiting room) and which, if deeply studied, is capable of broadening and enriching life and making religion a living force.

Walsh: Laughter and Health

LAUGHTER AND HEALTH. *By James J. Walsh, M.D., Ph.D., Sc.D., Litt.D., K.C.St.G., Medical Director of Fordham University School of Sociology; Professor of Physiological Psychology, Cathedral College, New York. New York and London: D. Appleton and Company.* 1928. *Price* $1.50.

This is a serious book about laughter, written for the physician and the intelligent layman. It does not attempt to tell why we laugh at various jokes or at certain bodily peculiarities of the people we meet; but it does tell what the laughter accomplishes in favorably altering our physiologic processes.

Dr. Walsh maintains that laughter is a positive therapeutic procedure and a partial antidote, at least, for our sedentary lives, as well as being a potent remedy in most of the neuroses, the victims of which are inclined to take themselves and the world too seriously.

Separate chapters describe the direct effects of laughter on the lungs, heart, liver, pancreas, spleen and endocrines, stomach and intestines; as well as how it influences the mind and its value in surgery.

An interesting treatise on an unusual subject.

Lindsey & Evans: Companionate Marriage

THE COMPANIONATE MARRIAGE. *By Judge Ben B. Lindsey and Wainwright Evans. New York: Boni & Liveright,* 1927. *Price* $3.00.

Few books of this generation have aroused wider discussion than this one, and most of the unfavorable criticism seems to have emanated from persons who had not read it at all or had skimmed it superficially, looking for trouble, and who had a keen distaste or fear of having the truth brought into the daylight for examination.

Companionate marriage is defined as: "A state of *lawful wedlock*, entered into for love, companionship and cooperation, by persons who, for reasons of health, finances, temperament, etc., are not prepared, at the time of their marriage, to undertake the care of a family." It is based upon the idea that reliable contraceptive information should be given freely to the contracting parties, and that divorce by mutual consent

should be granted, so long as there were no children, actual or prospective.

Every observant and thoughtful person realizes, as the authors contend, that this is no new thing. People have, for years, been entering upon marriages with the deliberate intent of remaining childless until their economic position was established; and people have been regularly getting divorces by mutual consent ("collusion"). The only difference in the new scheme would be that the contraceptive advice and the divorces would be free and legal, instead of "bootlegged."

The judge maintains that subjective habits are not genuinely ethical, but predigested and unoriginal; that the control and direction of custom are functions of the living, not of the dead; that economics, rather than ethics, governs sex taboos; and the allowable conduct is that which society permits.

These questions are not for the future. The conditions are with us *now*. The attitude toward sex is changing. Twenty—or even ten—years ago, short skirts and one-piece bathing suits were considered "wrong"; now they are universally accepted.

Companionate marriage is not "trial marriage", but as valid as any other contract of the kind, and it would not appeal to those who desire sexual promiscuity, any more than do our present marriage arrangements, because it would be under social observation and control.

Here is no sentimental propaganda of praise or blame for the changing social standards of the present day, but a calm, truthful *clinic in domestic relations*, conducted by the man who probably knows that subject better than any other person in the United States. The comments upon the "cases" presented are the logical and unbiased opinions of an expert.

This is a book that no student of human beings and of social conditions (especially no physician) can afford *not* to have read. Its detractors are usually those who do not know what the author means and lack the intellectual equipment ever to find out (like the legislators of Tennessee), or those (like some divorce lawyers) who feel their personal graft slipping.

In time to come this book will, we believe, be recognized as one of the outstanding contributions to sociology.

Buzello: Suppurative Infections

DIE AKUTEN EITRIGEN INFEKTIONEN IN DER CHIRURGIE UND IHRE BEHANDLUNG. (*The acute suppurative Infections in Surgery and Their Treatment*). *By Dr. Arthur Buzello, Privatdozent and Assistant at the Surgical Clinic and Polyclinic in Greifswald. Berlin: Urban and Schwarzenberg.* 1927. *Price* $4.00.

We greet with pleasure a well organized and well written book which contains, in nearly 500 pages, all that any one should know of surgical infections, according to the present-day practice.

The work takes up the bacteriology of infections of a surgical character; reviews immunity, phagocytosis, etc., and considers the various methods of treatment, including artificial hyperemia, x-ray therapy, protein therapy, vaccines, autopyotherapy, autohemotherapy, autogenous tumor therapy, etc.

While there is nothing startlingly new in this monograph, it has value, because it views the entire subject exhaustively and critically.

G.M.B.

Knopf: Birth Control

VARIOUS ASPECTS OF BIRTH CONTROL, MEDICAL, SOCIAL, ECONOMIC, LEGAL, MORAL AND RELIGIOUS. *By S. Adolphus Knopf, M.D., (Univ. New York and Paris), Major Med. Off. Res. Corps (Aux.) U. S. A., Consulting Physician to Riverside Tuberculosis Hospital, Gabriel Sanatorium, N. Y., Etc., Fourth Edition, Revised and Enlarged. New York City: The American Birth Control League, Inc., 104 Fifth Avenue.* 1928. *Price 50 cents.*

The medical profession and others engaged in welfare work are fortunate in having access to a new edition of this valuable little book, whose third edition was reviewed in CLIN. MED. AND SURG., in June, 1927.

All that was said of the third edition is true of this. The need for contraceptive teaching seems to increase rather than diminish, and Dr. Knopf keeps in close touch with what is going on in this line.

A commendatory foreword by Dr. C. E. de M. Sajous, appears, and the author has taken occasion to add a chapter on The Legal Aspects of Birth Control and a list of birth control clinics and maternity health centers in the United States, as well as to bring the statistics up to date.

All profits from the sale of this book go to the League for propaganda work and the maintenance of birth control clinics.

It is to be hoped that this little work will be studied by all physicians and widely distributed among thoughtful people, so that the facts it contains may speedily become common knowledge.

Goodman: Story of Electricity

STORY OF ELECTRICITY AND A CHRONOLOGY OF ELECTRICITY AND ELECTROTHERAPEUTICS. *By Herman Goodman, B.S., M.D. With an Introduction by Victor Robinson, M.D. New York: Medical Life Press.* 1928. *Price* $1.50.

A sketch of the lives and work of the various contributors to the science of electricity, beginning with Gilbert of Colchester and ending with Edison and other present day inventors.

A readable, chatty little book which will be enjoyed by those interested in electricity and in the progress of science generally.

Bethea: Clinical Medicine

CLINICAL MEDICINE. *By Oscar W. Bethea, M.D., Ph.G., F.C.S., F.A.C.P., Professor of Therapeutics, Tulane Graduate School of Medicine; Professor of Clinical Therapeutics, Tulane School of Medicine; etc. Philadelphia and London: W. B. Saunders Company.* 1928. *Price* $7.50.

The author states that his object in writing this book was to aid that large body of physicians whose practice lies outside the pale of well-

equipped hospitals or wealthy homes in which most of the advantages of modern science are available. There is no doubt that there is a very large number of physicians whose practice lies in small homes and who must depend upon their own resources and clinical judgment in arriving at a diagnosis and in applying treatment. Dr. Bethea's book may be considered as an excellent epitome of general practice, judged on the basis of such limitations. Only about one hundred of the more commonly met diseases are dealt with, and they are handled in a plain and common-sense manner.

On looking over the volume one is struck by its conservativeness especially in regard to treatment. Apparently it is the author's intention to depart as little as possible from the well-trodden paths sanctioned by time and long use, both in the interpretation of clinical features and in methods of treatment. In many respects, judged from these viewpoints, the book might have been written twenty-five years ago.

Although the author states that he has made an effort to include the latest and most generally accepted information, we notice that he has not mentioned ephedrine in the treatment of hay-fever and asthma nor iodoxybenzoic acid in the treatment of arthritis. In the former he mentions epinephrin and in the latter the salicylates but the best literature of the past few years shows that the newer drugs have in both instances given much better clinical results than the older ones and have largely superseded them.

Berry: Brain and Mind

BRAIN AND MIND, OR THE NERVOUS SYSTEM OF MAN. *By Dr. R. J. A. Berry, M.D., F.R.C.S., F.R.S. (Edin.); Dean of the Faculty of Medicine and Professor of Anatomy, Including Histology, in the University of Melbourne; Honorary Psychiatrist to the Children's Hospital, Melbourne; etc. New York: The Macmillan Co., 1928. Price $8.00.*

The question of the relation between the brain and the mind has engaged the attention of thoughtful persons for hundreds of years; and while Dr. Berry has made a valuable contribution to the scientific factors which must enter into its solution, it can not, by any stretch of the imagination, be considered as conclusively solved in or by this interesting book.

The author frequently repeats the dogma; "no neurone, no mind", but almost as frequently he alludes to the brain as the *instrument* of the mind—thus tacitly admitting that the mind is something other than the brain, which uses the physical substance in *manifesting* its activities, rather than in generating them.

One point which he stresses with sound sense is that no man is fit to deal intelligently with the diseases and aberrations of the mind unless he has a reasonably complete and accurate knowledge of the structure and functions of the brain and nervous system.

Part I, which occupies 447 pages, is an intelligent and highly informative discussion of the anatomy and physiology of the brain and nervous system, with frequent references to the correlations between physical structures and mental functions. Contrary to the usual custom, the author begins with the comparatively simple sympathetic system and progresses regularly to more and more complicated structures, ending with the brain. Diagrams and other illustrations are used rather freely and to good purpose.

Part II (110 pages) deals with the clinical application of a knowledge of anatomy and physiology. The point here insisted upon is that *amentia* (mental deficiency), of all grades, and dementia are accompanied by definite and measurable changes in the histologic structure of the cerebral cortex; and that these changes may result in a number of clinical symptoms.

Dr. Berry's style is brisk and forcible, so that this rather abstruse subject is not hard reading. Many of his ideas seem to be original and he argues well, though his logic is not always unassailable.

The book is attractively bound and printed from clear type on good paper. There is a bibliography of several pages; an appendix of charts and tables; and a satisfactory index.

No neuropsychiatrist can afford to overlook this work, as it appears to be a real addition to the literature, and no physician can study it without becoming a sounder and abler clinician.

Bassoe: Nervous and Mental Diseases

THE PRACTICAL MEDICINE SERIES. *Comprising Eight Volumes on the Year's Progress in Medicine and Surgery. Under the General Editorial Charge of Charles L. Mix, A.M., M.D.* NERVOUS AND MENTAL DISEASES. *Edited by Peter Bassoe, M.D., Clinical Professor of Neurology, Rush Medical College of the University of Chicago. Series 1927. Chicago: The Year Book Publishers, 304 South Dearborn Street. Price $2.25.*

The annual volume on nervous and mental diseases of the *Practical Medicine Series* gives abstracts of the important world literature for the year on these subjects with comments, when called for, by the editor.

This is an excellent means by which the specialist—or for that matter the general practitioner—can obtain a bird's-eye view of the year's progress in neurology and psychiatry, arranged in an orderly method, with the helpful criticisms of such an authority as Dr. Bassoe.

A Correction

In the review of Dr. Cooper's "Technique of Contraception" in the August CLIN. MED. AND SURG. (p. 621) the address of the publishers, Day-Nichols Co., was erroneously given as East 10th St. It should be 15 East 40th St., New York City.

MEDICAL NEWS

© Henry Miller News Picture Service, Inc.

Dr. Neil Flies to Her Patients

Dr. Elizabeth W. Neil, a gynecologist of Oakland, Calif., is said to be the first woman physician to use an airplane in making professional calls. She is a qualified, licensed pilot and has made a number of trips alone, some covering considerable distances.

Interstate Postgraduate Medical Assembly

The annual assembly of the Interstate Postgraduate Medical Association of North America will be held this year in Atlanta, Georgia, October 15 to 19 inclusive. All medical men in good standing are privileged to register, and all are cordially invited to attend.

The sessions of this Association are always of exceptional interest and value, and Dr. George W. Crile has this year prepared a program which lives up to the best traditions, including a number of notable men from foreign countries.

No meeting of the year offers richer returns to the men who attend it, and all who can possibly arrange to be in Atlanta during the third week in October will be well repaid for their expenditure of time, money and effort.

American College of Physical Therapy

The third Clinical Congress on Physical Therapy will be held, with the seventh annual meeting of the American College of Physical Therapy, in Chicago, at the Hotel Stevens, October 8 to 13, 1928.

In addition to general programs of a highly interesting and practical character, symposiums on *cancer* and *tuberculosis* will be conducted. Material of value to specialists in all lines, as well as to practitioners, will be presented. The commercial exhibit will be exceptionally large and varied.

Among the distinguished guests and lecturers will be Dr. Carl Sonne, of the Finsen Medical Light Institute, Copenhagen, Denmark, Prof. Dr. Donato de Francesco, of Venice, Italy, and Dr. A. R. Friel, of London, Eng.

All licensed physicians, with their *bona fide*, non-medical assistants and technicians, as well as hospital executives, are eligible to register for the meetings, clinics and round-table discussions. No one who is using or expects to use physical measures in the treatment of disease can afford to miss this meeting.

Full information can be obtained from The American College of Physical Therapy, Suite 820, 30 N. Michigan Blvd., Chicago.

Retirement for Disabled Emergency Officers

The Tyson-Fitzgerald Bill, providing for the retirement of disabled emergency officers, became a law on May 24, 1928.

All emergency officers lawfully rated as having *not less* than 30 percent disability are now entitled to retired pay at the rate of 75 percent of what they were receiving on discharge from the service.

Write to The Adjutant General, U. S. Army, Washington, D. C., for full particulars.

© Underwood & Underwood.

Part of an Interne's Training

The internes in the General Hospital, Cincinnati, Ohio, are required to feed the babies, as part of their training for the efficient practice of pediatrics.

Radiological Society of North America

The Radiological Society of North America will hold its 14th annual meeting at The Drake Hotel, Chicago, December 3 to 7, 1928. All physicians are invited to attend the meetings.

The Clinics, sessions and exhibits will embrace nearly every branch of medical science and the discussions should prove highly interesting.

Reservations may be made through Frank J. Ronayne, c/o West Suburban Hospital, Oak Park, Illinois.

Course for Physical Therapy Technicians

Northwestern University announces a course of instruction for physical therapy technicians, under the direction of Dr. John S. Coulter, Asst. Professor of physical therapy.

This course will run from October 1, 1928, to May 31, 1929, and is designed for graduates in physical education and graduate nurses, and will include both theoretical and practical teaching in all branches of physical therapy, including occupational therapy and administration.

For full particulars, address The Dean, Northwestern University Medical School, 303 East Chicago Avenue, Chicago, Illinois.

Yellow Fever in Brazil

The U. S. Public Health Service reports an epidemic of yellow fever in the coast cities of Brazil, 87 cases, with 29 deaths having been reported. There are probably many unreported cases.

Yellow fever in South America is always a menace to the United States, as there are plenty of yellow fever mosquitos (*Aedes Egypti*) in our southern states, and all that is needed to start an epidemic is to give them one case of the disease to feed upon.

Civil Service Examinations

The U. S. Civil Service announces the following open, competitive examinations:

Physiotherapy Aide
Physiotherapy Pupil Aide

Applications received until Oct. 9 and Nov. 27, 1928.

Senior Medical Officer
Medical Officer
Associate Medical Officer
Assistant Medical Officer
Junior Medical Officer (*Interne*)
Graduate Nurse
Graduate Nurse (*Visiting Duty*)
Graduate Nurse (*Junior Grade*)
Dietitian
Student Dietitian

Applications received until Dec. 29, 1928.

Full information may be obtained from the United States Civil Service Commission, Washington, D. C., or from the secretary of the United States Civil Service Board of Examiners at the post office or customhouse in any city.

Send For This Literature

To assist doctors in obtaining current literature published by manufacturers of equipment, pharmaceuticals, physicians' supplies, foods, etc., CLINICAL MEDICINE AND SURGERY, North Chicago, Ill., will gladly forward requests for such catalogues, booklets, reprints, etc., as are listed from month to month in this department. Some of the material now available in printed form is shown below, each piece being given a key number. For convenience in ordering, our readers may use these numbers and simply send requests to this magazine. Our aim is to recommend only current literature which meets the standards of this paper as to reliability and adaptability for physicians' use.

Both the literature listed below and the service are free. In addition to this, we will gladly furnish such other information as you may desire regarding additional equipment or medical supplies. Make use of this department.

I- 1 Helping the Cell to Help Itself, 32-page booklet by The Alkalol Co.

I- 2 Your Prestige and Profit. 8-page booklet. The Carroll Dunham Smith Pharmacal Co.

I- 3 Storm Binder and Abdominal Supporter, 4-page folder by Dr. Katherine L. Storm.

I- 4 Pluto Water. Its Medicinal Values. 16-page booklet. French Lick Springs Hotel Co.

I- 5 Ethical Medicinal Specialties. 8-page booklet. A. H. Robins Co.

I- 6 The Journal of Organotherapy. 95-page booklet published monthly. G. W. Carnrick Company.

I- 7 The Cure of Cystitis, Pyelitis and other Inflammatory Conditions of the Urinary Tract. Chicago Pharmacal Co.

I- 9 Hang This Up—It Tells How to Make Percentage Solutions. Sharp and Dohme.

I- 14 The New Ultra-Violet Therapy. McIntosh Electrical Corporation.

I- 17 An Index of Treatment. Burnham Soluble Iodine Co.

I- 20 A Survey of Focal Infection. Fellows Medical Co.

I- 37 pH 7.4, Alka-Zane. Wm. R. Warner & Co., Ltd.

I- 38 Hycol. The Certified Disinfectant. Merck & Co.

I- 39 A Convincing Solution of an Old Problem, Isacen. The Hoffmann-La Roche Chemical Works.

I- 40 Truth Spreads by Testimony, Isacen. The Hoffmann-La Roche Chemical Works.

I- 41 The Specific Treatment of Pneumonia with Numoquin-Base. Merck & Company.

I- 45 Vera-Perles of Sandelwood Comp. Paul Plessner Co.

I- 46 Bedtime Nourishment. Mellin's Food Company.

I- 47 Campho-Phenique in Major and Minor Surgery. Campho-Phenique Company.

I- 49 The Calcreose Detail Man. Maltbie Chemical Co.

I- 50 Outwitting Constipation. Standard Oil Co.

I- 51 The Ideal Anti-Gonorrheic. Riedel & Co., Inc.

I- 52 Cre-So-Mul. First Texas Chemical Mfg. Co.

I- 56 Regaining Health. How Science Can Guide You! The Fleischmann Company.

I- 58 The Pharmacology of Cod Liver Oil. Smith, Kline & French Co.

I- 67 The Electro-Pathology of Local Inflammation. The Dionol Company.

I- 70 Yeast Therapy. The Fleischmann Company.

I- 78 Nourishment for Adults and Children in Health or Illness. Mellin's Food Co.

I- 82 Service Suggestions, September-October, 1928. Victor X-Ray Corp.

I- 84 Latent Constipation—A Diagnostic Problem, Agarol. Wm. R. Warner & Co.

I- 85 Ultraviolet for Health. Hanovia Chem. & Mfg. Co.

I- 87 Journal of Intravenous Therapy. Loeser Laboratory.

I- 93 Britesun Therapeutic Booklet. Britesun, Inc.

I- 94 A Compendium of Glandular Therapy. Colwell Pharmacal Corporation.

I- 95 Everything for the Sick — Lindsay Laboratories.

I-103 The Electron, September, 1928. McIntosh Electrical Corporation.

I-106 Acidosis as a Complication in Winter Diseases. William R. Warner & Co.

I-110 When Colds Hang on and Coughs are Stubborn. The Hoffmann-La Roche Chemical Works.

I-112 Atophan after more than Fifteen Years of ever expanding use, etc. Schering & Glatz.

I-113 Forcep Deliveries and Versions. Battle & Co.

I-114 Infra Red Therapy. Britesun, Inc.

I-116 Hemo-Glycogen, The New Product of Hemoglobin Compound and Liver Extract. Chappel Bros., Inc.

I-120 Building Resistance. William R. Warner & Co., Ltd.

I-122 Cardiazol, an Emergency Stimulant and Sustaining agent for the heart. E. Bilhuber, Inc.

I-127 The Surgical Treatment of Goiter. The C. V. Mosby Co.

I-128 A New Book Written in Simple Language, Getting Well and Staying Well. (Tuberculosis). The C. V. Mosby Company.

I-135 Enemata—Petrolagar. Deshell Laboratories, Inc.

I-136 Obesity in Females. The Tilden Company.

I-139 How to Save Children from Goiter. Morton Salt Company.

I-153 Caprokol. Sharp & Dohme.

I-156 Siomine (Methenamine Tetraiodide). Pitman-Moore Company.

I-167 A New Animal Skin Hormone Preparation. Amorskin Corporation.

I-169 The Quartz Lamp, Sept. 15, 1928. Hanovia Chemical & Mfg. Co.

I-170 Making Vitamin D Plentiful and Palatable. Pitman-Moore Company.

I-171 Detoxification Clinic, No. One, Oral Prophylaxis. The Wm. S. Merrell Company.

I-172 Detoxification Clinic, No. Two, Pyorrhea . . . . The Cause and Simplified Treatment. The Wm. S. Merrell Company.

I-173 Biological Products, Antitoxins, Curative Sera, Bacterial Vaccines, Rabies and Small-Pox Vaccines, 18-page booklet by The National Drug Co.

I-174 The Etiology and Treatment of Poison Ivy and Poison Oak. 16-page booklet by The National Drug Co.

I-175 Menorrhagia and Metrorrhagia. The Harrower Laboratory.

I-176 The Hormone—24 pages and cover, published bimonthly.. The Harrower Laboratory.

I-177 A Symptomatic Treatment of Tuberculosis. 32-page booklet. Loeser Laboratory.

I-178 X-Ray Tables — Roentgenoscopes, Stereo Units—Tube Stands, Fluorographic Units, Accessories. Victor X-Ray Corporation.

I-179 "Wantz Jr.", X-Ray Apparatus, Victor Intermediate Model. Victor X-Ray Corporation.